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ENTOMOLOGIA EDINENSIS.

ENTOMOLOGIA EDINENSIS,

OR

A DESCRIPTION AND HISTORY

OF THE

INSECTS FOUND IN THE NEIGHBOURHOOD OF EDINBURGH.

BY

JAMES WILSON, F. R. S. E., M. W. S., &c.

AND

THE REV. JAMES DUNCAN, M. W. S.

COLEOPTERA.

WILLIAM BLACKWOOD, EDINBURGH; AND
T. CADELL, LONDON.
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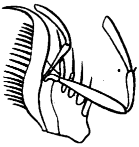
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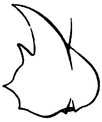
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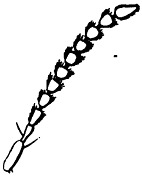
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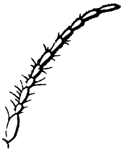
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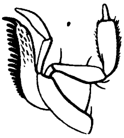
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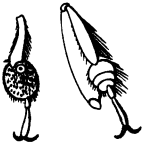
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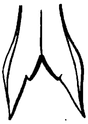
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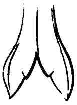
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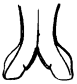
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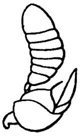
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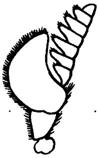
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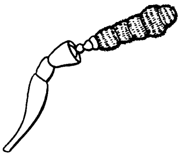
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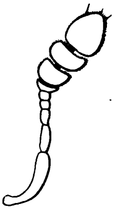
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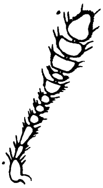
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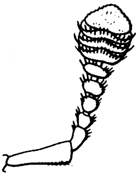
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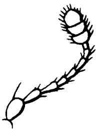
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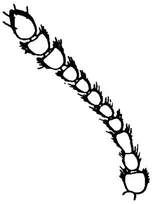
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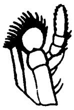
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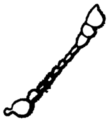
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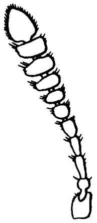
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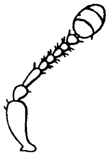
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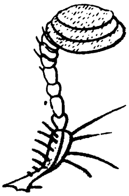

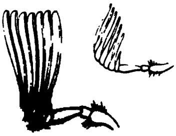
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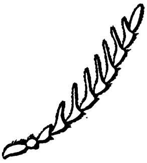
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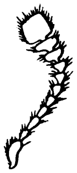
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EXPLANATION OF THE PLATES.

The majority of these figures are copied from Mr Curtis's "British Entomology;" some are derived from other works, and a few are original. They represent the objects greatly magnified.

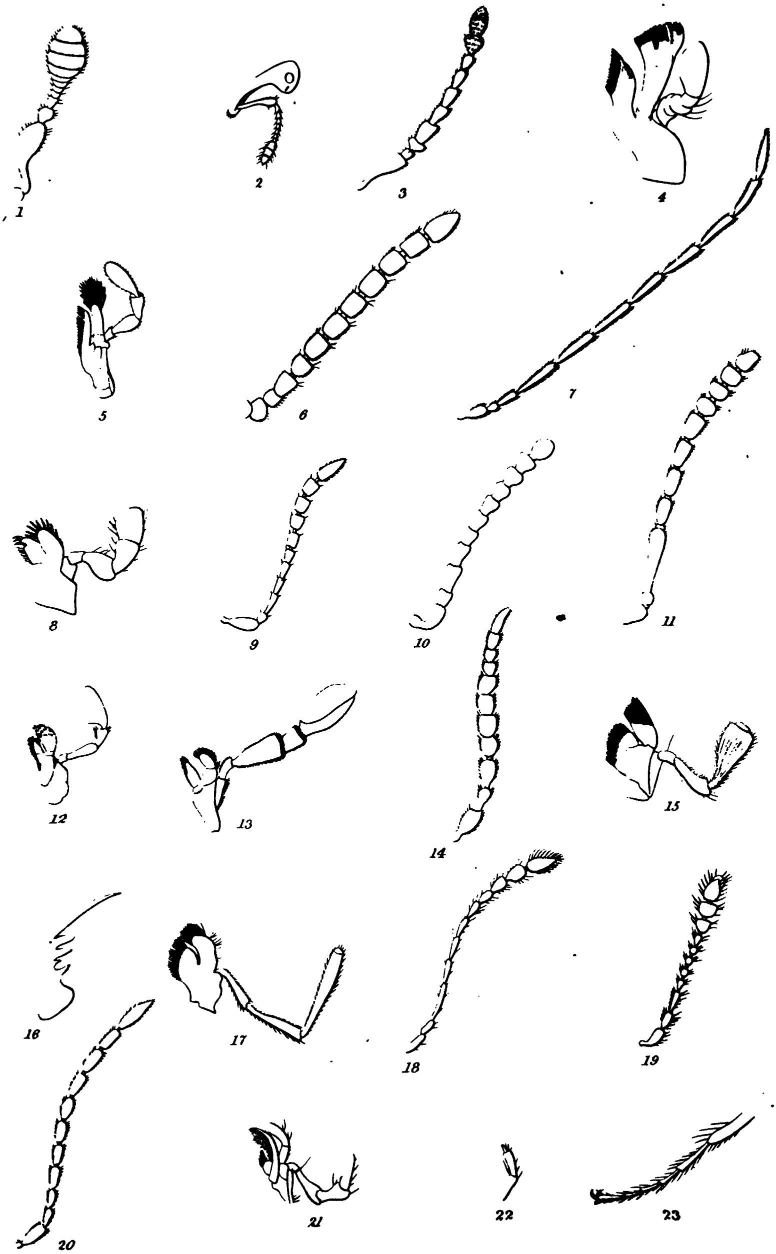
PLATE I.

Fig. 1. Maxilla of Leistus, shewing the spinous process at the base.
—— 2. Mandible of ditto.
—— 3. Moniliform antenna of Clivina.
—— 4. Antenna of Loricera.
—— 5. Maxilla and maxillary palpi of Cillenum.
—— 6. Patelliform tarsi of a male Dytiscus.
—— 7. Lobes of the sternum in Dytiscus circumflexus.
—— 8. Ditto, in D. marginalis.
—— 9. Ditto, in D. punctulatus.
—— 10. Antenna of Gyrinus.
—— 11. Ditto of Parnus.
—— 12. Ditto of Enicocerus.
—— 13. Ditto of Hydrobius.
—— 14. Ditto of Leiodes.
—— 15. Ditto of Necrophorus.
—— 16. Ditto of Nitidula.
—— 17. Ditto of Cryptophagus.
—— 18. Maxilla and palpus of Bitoma.
—— 19. Antenna of Latridius.
—— 20. Ditto of Byrrhus.
—— 21. Ditto of Onthophilus.
—— 22. Ditto of Geotrupes.
—— 23. Ditto of Melolontha, male and female.
—— 24. Ditto of Ctenicerus.
—— 25. Ditto of Necrobia.

PLATE II.

Fig. 1. Antenna of Hylurgus.
—— 2. Rostrum and Antenna of one of the Curculionidæ.
—— 3. Antenna of an Apion.
—— 4. Maxilla and maxillary palpus of Clytus.
—— 5. Ditto of Leptura.
—— 6. Antenna of Crioceris.
—— 7. Ditto of Luperus.
—— 8. Maxilla and maxillary palpus of Chrysomela.
—— 9. Antenna of Cassida.
——10. Ditto of Tenebrio.
——11. Ditto of Blaps.
——12. Maxilla and maxillary palpus of Helops.
——13. Ditto of Melandrya.
——14. Antenna of Meloe.
——15. Maxilla and maxillary palpus of Paederus.
——16. Mandible of Rugilus.
——17. Maxilla and maxillary palpus of Dianous.
——18. Antenna of Stenus.
——19. Ditto of Syntomium.
——20. Ditto of Lesteva.
——21. Maxilla and maxillary palpus of ditto.
——22. Maxillary palpus of Tachyporus.
——23. Hinder tarsi of Drusilla.

PLATE II.



Lizars sc.

——— ubi pulsam hiemem sol aureus egit
Sub terras, cœlumque æstivâ luce reclusit;
Illæ continuo saltus silvasque peragrant;
Purpureosque metunt flores, et flumina libant
Summa leves.

VIRG. *Geor.*

ERRATA.

Page 166. line 39, *for* fig. 19. *read* fig. 18.
—— 252. line 15, *for* lineatus. *read* lineata.

INTRODUCTION.

The study of the numerous class of beings comprehended under the name of Insect, has long been a favourite occupation with men of science in all the continental countries of Europe, and has assumed, of late years, in the southern parts of our own island, a character of considerable importance. Works have been commenced, and brought towards a state of completion, which need fear no comparison with the most finished examples of pictorial representation; and when we consider how sparingly the subject of Entomology has been hitherto patronised by the public, we cannot sufficiently esteem the exertions of those who have thus devoted their time and talents to a pursuit, which brings with it no other reward than the delight which every instructed mind necessarily draws from the contemplation of a favourite subject.

In Scotland, this branch of Zoology has been much more sparingly investigated than in the south, although we cannot doubt that the same zeal and intelligence which have led so many of our countrymen to distinction in other walks of science, would here also reap a rich harvest, were they devoted with a continued zeal to a study in every way so worthy of attention.

Various circumstances have recently tended to impress the authors of the present volume with the conviction, that the want of a clear and compendious work, of an elementary and descriptive nature, was the chief obstacle to a more rapid progress in this delightful department. The botanist and mineralogist have been long furnished with their respective Manuals; and even the student of zoology who selects those more conspicuous branches of the science, which embrace the history of mammiferous animals, or of the feathered tribe, finds little difficulty, at least in relation to European objects, in ascertaining with precision the name and nature of whatever specimens may be submitted to his examination. But, to an individual who has not long and sedulously laboured in the practical pursuit of Entomology, it would be a forlorn hope to attempt the classification of insects, even of the most abundant and apparently familiar kinds—so numerous are the species, and so slight and almost evanescent the characters, by which they are distinguished from each other. Besides, there is in fact no descriptive work within reach of the ordinary student, from which, by a comparison of specific characters, he is likely to attain the required knowledge; and thus a pursuit of a somewhat difficult and complex nature, even when aided by a lucid system of arrangement, becomes, in absence of such aid, not only arduous, but repulsive.

From whatever cause our neglect of Entomology may have arisen, it cannot but be a matter of regret, that such an interesting field as this country presents, should have remained so long in a great measure unexplored. No doubt can be entertained of its being well adapted, by its physical characters, to reward the labours of the collector. The diversified nature of its surface, in regard to soil, vegetation, and temperature, affords appropriate places of resort to species of very dissimilar habits. The southern division of the country, approximating in the character of its geology and botany to the northern portion of England, may be expected to furnish us with most of the insects that occur in that quarter. Our deep indented shores, and numerous inland waters, offer a fair field for the occurrence of littoral and aquatic species; while the alpine lands of the north will doubtless present their own peculiar races. It is probable, indeed, that they will produce a considerable number of the kinds that occur in the same latitudes on the continent, particularly in Norway and Sweden*. The indigenous insects of these countries are well known to us by the elaborate works of PAYKUL, GYLLENHAL, and SCHÖNHERR; and it would be interesting to ascertain how far they are identical with the productions of our own island, and what effects have been produced on the latter by their insular position. A careful examination of Scottish Entomology would therefore not only afford many important accessions to our native zoology, but would also supply materials to illustrate the distribution of animal life over the earth's surface.

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* One of the first insects which we took last summer during an excursion to the mountains of Clova, in Forfarshire, was the *Clivina arctica* of GYLLENHAL and DE JEAN, a species (every where rare) which occurs in Lapland, the north of Sweden, Finland, and, occasionally, as far to the east as the environs of St Petersburgh.

We commence an attempt to rescue our northern Entomology from neglect, by a historical and descriptive account of the Coleopterous Insects of the Edinburgh district. The species described in the present volume have been collected within six or seven miles of the city, except in a few instances (*e.g.* the Glow-worm), where these limits have been exceeded, in order to admit certain rare or otherwise interesting species. We restrict ourselves in the mean time to the *Coleoptera*, from a desire to render our enumeration of that Order as complete as circumstances would admit. It is the department which is most generally studied, and it is also considerably more extensive, as well as more difficult than the others; while, at the same time, the important functions which its members perform in the economy of Nature, and the injurious consequences which not unfrequently result to the farmer and the horticulturist, from their superabundant increase, render a knowledge of their special haunts, and general distribution, more than usually desirable.

Many years ago, a list of the Edinburgh insects was drawn up by the late Mr CHARLES STEWART *. It embraces all the Linnean orders, and gives a brief enumeration of the more common species belonging to each. None of the minuter kinds, however, are included, and it is confessedly very defective even in those of a more conspicuous character, excepting only the diurnal *Lepidoptera*, a showy and restricted tribe, to which few additions have since been made. Of coleopterous insects, scarcely more than a hundred are recorded. Of these a few are rare, and have not since been met with in the district to which the list refers. Indeed, the vagueness of the Linnean descriptions (which Mr STEWART seems chiefly to have consulted), or at least that extreme briefness which renders their determinate application sometimes rather difficult, amid the now greatly increased amount of species, has unfortunately led him to introduce the names of several insects not otherwise known to be indigenous to Britain, and which the assiduous researches of later inquirers have failed to discover. More recently, one of the authors of the present volume published a more ample catalogue of the Coleopterous tribes of the same district*, in which he extended the amount of species, from the number just mentioned, to 545. The total amount of British Coleoptera, as given by Mr STEVENS, is 3298†. Of these, we now describe, as indigenous to our own neighbourhood, a fair proportion; and we have ascertained and recorded the stations in Scotland of nearly one-half of the whole. This, considering the paucity of labourers over a field so widely spread, and occasionally by no means smooth, we are sanguine may be regarded as an interesting, if not important addition, to our native entomology; and, as such, we venture to offer it not only to our inexperienced countrymen, but to our more skilful and assiduous neighbours in the south.

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* List of Insects found in the neighbourhood of Edinburgh.—*Memoirs of Wernerian Society*, vol. i. p. 566.—Read in April 1809.

It is long since MARSHAM expressed his regret at being so imperfectly acquainted with the entomology of the northern parts of the island. Indeed, in all the earlier works that profess to treat of the insects of Great Britain, the reference to Scotland is scarcely more than nominal. The *Entomologia Britannica*, for instance, of the author just named, gives the locality of only *one* Scottish insect; and there is no work prior, or for many years subsequent to his, of a more satisfactory nature. We cannot acquiesce in the opinion of Mr STEWART, that the neighbourhood of Edinburgh may be regarded as unproductive in this class of creatures. On the contrary, it seems to us as well adapted, by local circumstances, to the purposes of the entomologist, as most other portions of the country. Its picturesque and varied scenery, so rich in botanical productions, is equally adapted to an extended circle of insect life. The shores of the Frith of Forth supply a number of maritime species peculiar to such situations. The intermediate grounds, though perhaps too much subjected to tillage, contain many flower-gardens, surrounded by green pastures, and these divided by old walls and hedges, with occasional streams, the banks of which are of varied vegetation, present to the entomologist many choice localities. We have likewise in the lower grounds several quarries, gravel-pits, and other excavations, with frequent belts of planting, and occasional groups of " old ancestral trees," among which many species probably still remain to be discovered. The Pentland Hills,

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* Catalogue of Coleopterous Insects found in the neighbourhood of Edinburgh, with occasional reference to their localities. By Mr JAMES DUNCAN.—*Memoirs of Wernerian Society*, vol. vi. p. 443.—Read March 1831.

† Systematic Catalogue of British Insects, part i. p. 299.—Published 1829.

> " Where the bold steps of hunter men have been,
> And creeping lichens find their lonely lair,"—

attaining, even in their nearer range, to an elevation of 1616 feet, produce the kinds which frequent moorland and elevated heaths; while there is a sufficiency of lochs, marshes, and other reservoirs of water, over the general surface of the district, for such as are aquatic.

> " See what a glorious picture lies unrolled
> Between you and the ocean's endless smile
> Of rippling waves—green wood and greener wold,
> Fringing the rocky buckler of our isle,
> Whose strength is stern and stedfast, but not cold—
> And yon gay sands, o'er many a golden mile,
> Upon whose vanishing and glittering lines
> The light and curling foam caressing shines.
>
> " One solitary step—how shifts the scene!
> A loftier mountain lifts into the air,
> Far up, a bolder sweep of darker green
> Than that we tread on. O the broom is fair
> That dallies on the brink of yon black screen,
> Yon crags prerupt, which, o'er the murky glare
> Of crimsoned smoke, their gloomy ledges shoot,
> Like battlements along the mountain root.
>
> " For lo! even in the shadow of the hills,
> Our fathers have their deep foundations laid,
> And their old city, like a lioness fills
> The shade that gives her shelter, and that shade
> Is proud of her whose low voice wakes and thrills
> Her echoes—whose majestic couch is made
> Where all things round free Nature's power express,
> The sea, the mountains, and the wilderness."

To these and other advantages of the environs of the Modern Athens, must be added at least their equality, in respect to entomological riches, with most other districts of Scotland *.

The value of correct local catalogues is admitted by all who view the subject in its general bearings, and who perceive, even in an otherwise uninteresting list of names and synonyms, the true materials with which to found the science of zoological geography. It has been suggested to us, that a description of all the coleopterous species hitherto ascertained to be indigenous to Scotland, might have been published, with a more imposing effect, as a portion of the *Entomologia Scotica;* but the species of the Class *Insecta* are in truth so numerous, that, even while confining ourselves to a single order, we should, with the extension alluded to, have run the risk of swelling our work to undue dimensions, or rather have incurred the necessity of increasing its amount of volumes. Although we have for this reason restricted our *descriptions* to the species of the neighbourhood, we have been careful to record the *names*, either in the form of notes or otherwise, of all the coleopterous insects which have come to our knowledge as captured in any part of Scotland; and to these we have added the special locality, whenever we could do so with certainty.

In the conduct of this little work there were two plans, in accordance with one or other of which it might have been executed. It might have been assimilated to our local Floras, in which the totality of the native plants are enumerated and described, with scarcely any particulars in relation to their economical uses, or natural history properly so called. This mode carried with it the great advantage of being compendious,—thus rendering the volume of portable size, and of moderate price,—but in all other respects it would scarcely have sufficed for the object in view, which is not only to assist those who incline to the pursuit of Entomology, but to draw towards it some who may not hitherto have considered it as deserving of their regard. This branch of science, in fact, stands as yet in a different position from its beautiful sister subject of Botany, in connexion with which the great mass of mankind, however unconversant with the technical details, have many familiar associations. Every country-house has its flower parterres, and numerous cottages their showy borders; botanic gardens have been formed in the vicinity of the larger cities, and nursery grounds in the neighbourhood even of provincial towns; to say nothing of the "flower enamelled meads" which the sparkling spring and gorgeous summer call into fleeting but constantly renewed existence. In addition to the more attainable nature of the pursuit, some botanical knowledge is also regarded as a requisite branch of medical education, and although a tin-box and a microscope do not constitute a man of science, still the subject derives advantages from that general, though it may be, superficial culture. But in Entomology every thing exists in a different order of relation. No "trivial fond regards" come in aid of the impaler of insects, and even the creatures themselves are too often regarded with such abhorrence, that one feels the more inclined to admire how those who endeavour to hand them down to an ungrateful posterity should themselves be accused of cruelty. The other plan to which we have alluded, was therefore finally fixed upon as the more judicious, viz. to ingraft on the detailed expression of the technical characters and descriptions, such brief expositions of the history of the genera, and of the haunts and habits of the species, as might add to the interest of the general reader, without being in any way displeasing to the scientific student. We conceived that in this way alone could we gather around a lengthened list of unfamiliar names such associations as might eventually conduce to actual knowledge, although we fear that even as matters stand, there will be found more than a sufficiency of strangely compounded designations, by no means musical to "a Volscian ear." In this, however, we are free from blame, for being in no way ambitious of embroiling the subject by fresh incumbrances, we have added nothing to the rubbish heap of synonyms, but have rather chosen by a judicious selection (the principle of *suum cuique* being kept in view) to endeavour to present it in a form as simple as is consistent with its complex nature, and the admitted necessity of a multiplied subdivision.

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* As it is not only interesting, but important, to connect the characteristic or prevailing features of animal life with the peculiarities of climate, and as a general knowledge of the relations which exist between the dominating species and the physical characters of a country, can only be collected by degrees, we think it proper to state the following particulars regarding the climate of Edinburgh. The average temperature throughout the year, as deduced from a register kept at Canaan Cottage (about half a mile from the south-western suburb of Edinburgh), for ten years, from January 1821 to January 1831, is 47°.25. The instruments employed in making the observations are 300 feet above the level of the high water-mark at Leith. The average of the minimum thermometer for the same period, is 79°.5; making the average range of the thermometer during that time 64°.5. The greatest cold which occurred during these ten years was in 1826, when, on the 16th of January, the thermometer stood at 10°. The greatest heat which occurred during that period was likewise observable in the course of the same year, the thermometer, on the 24th and 25th days of June, standing so high as 87° in the shade. Thus, the range of the thermometer in 1826 amounted to 77°, which is the maximum for the time during which the register has been kept. The average quantity of rain for one year, as deduced from registers likewise kept at Canaan Cottage for nine years, is *26.922 inches.*

It may be thought that, where certain natural groups are represented in our district, by only a single species, we have occasionally given too much extension to our observations as introductory to its history; but we felt averse to the pursuance of any other course, so long as we deemed the generic notices likely to interest those who may have it in their power to add to the number of species. A slight disproportion of parts was regarded as less disadvantageous than a skeletonized presentment of the whole. The amount of species which we have described (extending to upwards of 200 genera) has necessarily, according to the plan pursued, introduced the general history of the leading groups of British Coleoptera, and as most of these are likely to occur in other parts of the country, the utility of the volume will not be confined to the district specified, but will extend to any portion of the British empire; while its portable form and moderate price, compared with other works on the same subject, will remove, it is hoped, one of the chief obstacles with which the students of Entomology in this country, now become numerous, have hitherto had to contend.

We have nothing more to say regarding our own personal relations to the subject, but as this volume may come into the hands of those who have hitherto bestowed no thought upon insects, otherwise than as things to be avoided or despised, we think it advisable to devote a few pages to a general consideration of Entomology. The time is gone by when an apologetical defence of the study might be required, or in which the works of Omnipotence were regarded as important in proportion either to their magnitude or immediate subservience to the human race; and although we desire not to fall into an opposite error, by maintaining the greater beauty and excellence of the more minutely elaborated designs of the Creator, we yet feel that they are fully more calculated to awaken our wonder and admiration. It would be easy to say that the richest and most elegant apparel which adorns the human race, is the product of a caterpillar; that the blistering medicines so essential to the practice of the sanitory art are compounded from a beetle; that honey and wax, so valuable as articles of domestic economy, are derived from the glad labours of a hymenopterous fly; and that even that splendid and regal dye, the "Tyrian purple" of ancient days, supposed to have been obtained from the *Purpura patula*, a shell-fish of the Mediterranean, is superseded by the tinctorial uses of the cochineal, a small and obscure insect, which nevertheless the skill of the chemist has rendered indispensable even to the garment of kings. But, in truth, far higher and more delightful results ensue from these researches, than can ever be named in the "*cui bono*" catalogue of a mere economist; for whatever tends to elevate the mind of youth above the grosser pleasures of sense, or even occasionally to disconnect our maturer years from the more turbulent occupations and harassing cares which life is heir to, assuredly carries along with it its own reward. Indeed, so far as our own experience extends, we have seldom failed to perceive a certain amelioration of character to follow a sedulous pursuit of natural history; and we think that a closer and more frequent attention to it would in active minds pre-occupy the place which is otherwise, in after years, too often devoted to more perilous courses. Even the pursuits of literature are too vague and objectless, and, except in minds of more than usual power, are seldom productive of any actual advance in the progress of intellectual knowledge,—while they not unfrequently engender a sickly sentimentalism, or other morbid affection, which every one except the sufferer knows to be separated *longo intervallo* from an approach to genius. But the objects which attract the attention of the naturalist, are not the melancholy creations of the human intellect, which present so often but a lurid brightness, or a dim eclipse, in which noble thoughts are obscured by the "darkening scales" of vice or folly. They are the work of HIM who cannot err, and who has doubtless not only peopled the teeming Earth and the translucent waters of the "great deep" with all their innumerable and varied wonders, for a wise and beneficent purpose, of which our instruction and amusement form at least a portion—but has, by the implantation of that strong instinctive love of nature, which all ingenuous minds possess, demonstrated His desire that we should enoble our humanity by magnifying His works, "the wondrous works of Him that is perfect in knowledge."

While the beautiful simplicity and regular order observable in those phenomena which proceed under the superintendence of Omnipotence, commonly called the operations of nature, are well adapted to the comprehension of understandings laying no claim to the highest order, the more complex relations of the subject present a vast field for speculative or theoretical exercise, sufficient to occupy the faculties of the most powerful minds. It is thus that, in its totality, the subject of Natural History holds out to each capacity the allurement of a mental occupation suited to every gradation of intellectual power; for while, in its mysterious inter-connexion with other branches of Natural Science, as well as in its own peculiar complexities, it cannot be effectively grasped by mere human understanding, —its manifold minor features may be scanned with intelligence by whoever desires so to do.

If, indeed, the value of a pursuit is to be estimated by the comparative ease with which it may be followed by persons of the most moderate fortunes, few can rank higher than Entomology. While the specimens sought for by the mineralogist and student of geology are frequently heavy and cumbrous, and not seldom extremely expensive, and while that sad representative of the beauties of the living Flora called a *Hortus siccus* is but a frail and fleeting memorial of the "days of other years," presenting, even after a tedious and troublesome process of preservation (by courtesy so called), no trace of their original brightness,—the most exquisite examples of entomological beauty, if not too roughly handled at the period of their capture, remain with the most ordinary attention for a lifetime in their pristine state,—and what that state actually is, all may satisfy themselves in the course even of the most superficial examination;

> "For Nature here wantons as in her prime,
> And plays at will her virgin fancies."

Exceeding in amount of species all the other subjects of zoology—unrivalled in the dazzling brilliancy of their colours, which combine the clearness and decision of tint possessed by flowers, with the exquisitely varied markings of the feathered race, and the metallic splendour of the mineral kingdom,—surpassed by no other work of creation in the wonderful structure of their parts, and certainly surpassing all in the adaptation of that structure to the perfect fulfilment of those natural, though to us still mysterious instincts, which in every age have excited the admiration of mankind, is it to be wondered at that the study of insects should occupy a prominent place in our pursuit of knowledge? Much more do we wonder, that thousands of the best educated, and in other respects most enlightened minds, should still feel averse to a study which unfolds such a world of unseen wonders.

The subject, too, is literally inexhaustible, and while some who love to methodise, and thereby to circumscribe, the subjects of human knowledge, or who err in their estimate of the perceptive powers of the human mind as applied to other matters of inquiry, may be deterred by the vague boundaries of such a field, a greater number, and with more propriety it is hoped, may be induced to enter it from the very consideration of such a rich and unreaped harvest. While a fragment of inert matter, which chemical analysis determines to differ in its constituent proportions from other fragments previously examined, is once in a lustre, dignified by the title of a new *species,* and the name of a HAÜY or a DOLOMIEU is bestowed on the unconscious mass;—and while even in the richer domain of British botany the student of that science, however much he may extend our knowledge of the localities of plants, labours with but a feeble chance of adding to the actual list of indigenous species, and has probably no chance at all of ever refreshing his eyes with the sight of a plant which nobody ever saw before—it is far otherwise with the innumerable tribes of insect life. The "gilded summer flies" are numerous as leaves in Vallumbrosa. No recess of the forest so obscure but there the "winged messengers" are seen to sport and play, and each summer sunbeam falls not alone on the dewy herbage of the open glades, but lights up the gorgeous hues of those bright creatures which a mystical philosophy has ennobled as the types of the disencumbered human soul, and which even the sombre Dante has named *angelical* *. Every pool of water is pregnant with life, each lonely moor or old deserted quarry, which scarcely "feels in its barrenness one touch of spring," is the chosen abode of thousands of living creatures, of small dimensions, it is true, but of singular beauty, both of form and structure, and often adorned with hues,

"Which make the rose's blush of beauty pale,
And dim the rich geranium's scarlet blaze."

Even the pastoral melancholy of the green mountains is enlivened by the occurrence of many interesting species. One of the most beautiful of European coleopterous insects (*Carabus nitens*) occurs among the peat-*hags*, and other places where heath and turf abound, and where its sparkling coat of gold and green, tinged with a brighter lustre than that of rubies, is singularly contrasted with the blackness of the soil in which it seems imbedded. The desolate and cloud-piercing summits of the highest hills produce several species, which are the more highly prized from their scarcity, and the difficulties with which they are obtained.

It may be safely averred, that in no district of Scotland will any assiduous collector be long engaged in the study of Entomology, without becoming possessed, not only of species which are rare and interesting, but also of others entirely new to Britain, and probably undescribed even by the more experienced collectors of the continent †. What renders the subject so particularly important at this time, is in fact the extreme meagreness of our knowledge of the entomological productions of our country, and the consequent value which even the most ordinary observations on the subject still possess, owing to our want of more extended data. An ample collection of the most common insects from the Shetland or Orkney Islands, or even from the northern counties of Scotland, would be highly esteemed by every one who knows the value of such local contributions, as determining the geographical distribution of species, one of the most interesting, and, in a philosophical point of view, most important of those inquiries which attach to natural history.

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* "Non v'accorgete voi, che noi siam vermi
Nati a formar l'angelica farfalla."

† "I may here observe," says Mr Stephens, "as an instance of the facility with which novelties may be obtained by individual exertion, that in the short space of forty days, between the middle of June and beginning of August last, I captured in the vicinity of Ripley above 2400 species of insects, exclusive of larvæ, &c., or nearly one-fourth of our ascertained entomological productions, amongst which, although upon *old* explored

We have alluded to the ease and *economy* with which the study of entomology may be pursued, more especially when our attention is confined to the species of a district. Of course the collector of foreign insects labours under some disadvantage from the more multifarious nature of his subjects, their larger size, higher price, and more scattered localities. But the home collector, especially of the coleoptera, is more favourably situated *. The total entomology of most districts may be amply illustrated within the bounds of a cabinet of a few feet square, and the most ordinary attention and regularity suffice for its preservation. Most districts produce species which are comparatively rare in other quarters, and thus by means of interchanges, numerous additions may be made from time to time,—so that, with a moderate share of assiduity and perseverance, a large collection may be amassed with little or no pecuniary outlay. In these and many other pleasant particulars on which we need not here dilate, Entomology possesses advantages over all the kindred branches of Natural History. We shall now pass to a short exposition of some of the more characteristic features in the anatomy and physiology of insects.

ground, were about 100 new species, not before in any collection, so far as I have inspected, including several perfectly novel genera, many of considerable size; and amongst the known insects, several reputed scarce were in considerable plenty, as hereafter detailed."—*Illustrations of British Entomology*, vol. i. p. 72. Note.

* A glazed frame or drawer, lined with cork, and capable of containing many hundred species, may be made for a few shillings.

Our knowledge of the structure and anatomy of this class may be said to be still in its infancy, for although many important facts have been legitimately generalized, we are still in ignorance of the formation of a thousand species, for every one which has been examined. As the harder parts of insects, to which the muscles are attached, are superficial, the class has been described as bearing their skeletons externally, and a transcendental anatomy has not scrupled to determine the exact analogy which each portion of their covering bears to the bony frame-work of the vertebrated tribes. This comparison has been instituted by M. GEOFFROY ST HILAIRE, while another accomplished anatomist, M. de BLAINVILLE, regards the corneous covering of insects rather as analogous to the skin of the higher orders. The chemical composition of the harder portions of this class has been attentively examined, among others by M. AUGUSTE ODIER.* On analyzing the elytra of the Cockchaffer, he ascertained the existence, 1st, of albumen; 2d, of an extractive matter soluble in water; 3d, of a brown-coloured animal substance soluble in potass, and insoluble in alcohol; 4th, of a coloured oil soluble in alcohol; 5th, of three salts, viz. subcarbonate of potass, phosphate of lime, and phosphate of iron; 6th, of a peculiar substance which constitutes a fourth part in weight of the elytron. Albumen is so generally distributed among the animal organs, that its presence was to be expected. But the oil is deserving of further experimental observation. ROBIQUET found it of a green colour in Cantharides, while, according to ODIER, it is brown in the Cockchaffer, and red in Crioceris. Now, as each of these insects is itself of a corresponding hue, it is natural to suppose that the oil is the colouring matter. The peculiar substance which forms so large a proportion of the elytra is named *Chitine* by M. ODIER. If we plunge a coleopterous insect (*Scarabæus nasicornis*, for example) into a solution of potassium, and keep up a pretty high temperature, we shall observe that the so-called skeleton neither dissolves nor changes its form; it merely becomes discoloured during the operation, while all the viscera and interior muscles disappear, and whatever remains of the insect is *chitine*. This substance exists in the whole of its envelope, and is also found to occur in the more solid covering of the Crustacea.

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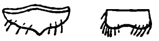
* *Mem. de la Soc. d'Histoire Naturelle*, t. i. p. 29.

If, however, we compare the preceding results with those obtained by M. Chevreul in the course of his experiments on crustaceous animals, we shall perceive some remarkable distinctions in the constitution of their harder parts. The presence of subcarbonate of potass is a striking character among insects. It does not occur in the class Crustacea. The phosphate of lime, a sparing ingredient among the latter, forms a preponderating part of the salts in the envelope of insects, while the carbonate of lime is absent in the latter, and forms the base of the covering in crabs and lobsters. It has been stated as a regulating law in animal chemistry, that the bones of the higher orders had more of the phosphate and less of the carbonate of lime in their composition, while the proportions were reversed among the inferior tribes. But the observations of M. Odier shew the inadequacy of chemical character to serve as a basis on which to found our analogies of organization; for if strictly applied to insects, that class must be removed from the place which they now occupy in our system, and be combined with others of a higher nature, with which, in truth, they have no connexion.

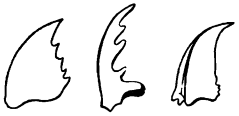
The covering of insects of the same species, differs greatly according to the existing condition of the individual. The segments of which the bodies of larvæ are composed, are generally of a uniform size when compared with each other, and the singular phenomena presented by metamorphosis, consist chiefly in the greater development assumed by certain segments than by others. The nymph or pupa (called Chrysalis among the Lepidoptera) exhibits the intermediate or transitionary state. Its segments are unequally developed, and this inequality is greatly increased on the assumption of the final state, in which certain segments are prodigiously enlarged, while others suffer a corresponding diminution. In the imago or complete condition, the three segments next the head undergo the most notable alteration,—for besides their increase of bulk, they become furnished with wings and articulated legs, which had previously existed in a very rudimentary condition. In that state, also, the relative proportions of the segments are so changed, that the identity of several becomes difficult to recognise, and the most obvious divisions henceforth consist of *head*, *thorax*, and *abdomen*. These parts are severally characterised by peculiar attributes.

The *head* is by far the most complicated portion, and it is necessary that its structure should be well understood, as it furnishes the most important characters on which modern genera are founded. In the great section of Geodephagous insects, it is usually of a triangular form; in many of the short elytra'd tribes (Brachelytræ) it is orbicular; and in the Weevils (Curculionidæ) it is prolonged into a pointed rostrum or beak. The hinder part is frequently contracted into a short neck, and is inserted into a cavity of the thorax in which it moves as in a socket. The parts most deserving of attention are the *mouth*, *antennæ*, and *eyes*.

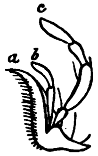
The organs of the *mouth* vary in form and structure in the different tribes, but they are essentially as follows:—the *labrum*, the *mandibles*, the *maxillæ*, the *palpi*, the *labium*, and the *mentum*.



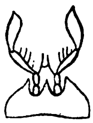
The *labrum* or upper lip is a flat horizontal plate, placed on the upper side of the mouth, and capable of moving upwards and downwards, or vertically. It is variable in form, but is usually somewhat square, often wider than long, frequently notched or bifid, and of a horny consistence. It is attached to the anterior portion of the head by a very short articulation.



The mandibles or upper jaws are two strong horny pieces, of a triangular form, more or less curved, and frequently toothed or serrated on their inner edges. They are placed on each side of the mouth, by insertion on the sides of the head, immediately beneath the labrum or upper lip, which usually covers their base. They are each composed of a single piece of a hard consistence, and may be said to correspond to the jaws of the vertebrated animals, with this difference, that their motion, instead of being vertical, is horizontal, or from side to side. Their internal surfaces are frequently parallel, but the dentations are seldom alike in both,—the projections of the one being so arranged as to enter the concavities of the other, in order to admit of their closer junction. This, however, is often prevented by the curvature of the tips; and in several instances where the mouth is wide, and the mandibles rather remote from each other at the base, the blades cross each other a little beyond the centre. The name, which is derived from a Latin word signifying to chew, indicates their function, which is to bruise and comminute the food. They likewise act as instruments of prehension. The mandibles are more variable in their forms than the maxillæ, and may be observed to differ (as in the genus Lucanus), even in the sexes of the same species.



Immediately below the mandibles are placed the *maxillæ* or under jaws (*a*), which are likewise fixed on each side of the mouth, and take their rise from the inferior and internal part of that cavity near the origin of the under lip. Like that of the preceding organs, their action is horizontal, but their texture is less rigid, approaching to membranous, their colour usually paler, and their internal edges ciliated or finely fringed with hairs. Towards the middle of their outer edge are attached two slender articulated filiform processes named palpi; the longer pair (*c*) being the external, the others (*b*) the internal palpi. Both are called *maxillary*, to distinguish them from the *labial* palpi afterwards mentioned. These appendages are distinctly articulated, or composed of several jointed parts, and are capable of rapid and extended motion. They derive their name from a Greek word which signifies to feel, and are supposed to constitute one of the principal organs of touch. That they perform that function is rendered extremely probable by their structure, which is well adapted by its peculiar pliancy to the examination of the objects with which they come in contact. The palpi are in fact analogous to the articulated extremities which form the principal seat of the sense of touch in vertebrated animals. As accessory to the maxillæ, they are employed in the selection of the most suitable alimentary portions of whatever substances have been previously seized upon by the more powerful parts of the mouth. In many insects there is only a single palpus to each of the maxillæ.



As the mouth is covered above by the labrum or upper lip, so it is closed beneath by the under lip or *labium*. This part differs in its structure from the labrum, being composed, as it were, of two portions joined together by their inner edges. In its general form it is broad and short, usually notched in front, and frequently furnished with a triangular tooth in the centre, which is sometimes bifid. Mr Kirby defines the labium as a moveable organ often biarticulate, which terminating the surface anteriorly, covers the mouth from beneath, and is situated between the maxillæ. It includes the mentum and labial palpi. The more uncovered portion of the labium, or that which projects from the basal portion, is named languette (ligula) by Latreille. The *mentum* or chin is the lower joint of the labium, when the latter is jointed; in other cases its base. Among the greater proportion of masticating insects, there is placed anteriorly at each side of the languette a small supporting piece or article, which takes its rise a little above the pharynx, and is terminated by a projecting appendage. These parts are named paraglossa by some authors, and M. Latreille regards them as the true representatives of the tongue of the higher tribes. The *labial* palpi are inserted on each side of the languette, and are usually longer than the internal, and shorter than the external, maxillary palpi. These palpi have never more than four articulations, in which they also differ from the external maxillary, which in some orders range from four to six.

These are the principal parts of the mouth of coleopterous insects. At the root of the languette, and a little below the middle of the interior space which intervenes between the mandibles, is placed the *pharynx*. We shall not here describe the appendage which serves to close that opening of the œsophagus, because the observations of Reaumur and Savigny on this subject were made in relation to certain species of the hymenopterous order, with which we are not at present concerned. We doubt not, however, that the *epipharynx* or *epiglossus* of the last-named laborious and most acute observer, will be found to have its analogue, under some modified form of structure, in the coleopterous tribes.

The next appendages of the head which we have to consider, are the *Antennæ.* These organs never exceed two in number in genuine insects, although their form, and the amount of articulated portions, are extremely various. Their primary use in the animal economy has not yet been ascertained—at least a great diversity of opinion exists on the subject. In many tribes, they seem to exercise a faculty analogous to that of touch, being employed in exploring the depths of crevices, and in ascertaining by contact the nature of any opposing obstacle; while, on the other hand, their extreme shortness in most Diptera, and in many of the neuropterous and hemipterous tribes, does not accord with that usage. Although of considerable importance in our systematic arrangement of insects, the development of the antennæ does not seem subjected to any very general or well established rules, and is therefore of less value than that of certain other parts of structure. For example, we frequently find a considerable difference to exist in the form of the antennæ among species in other respects intimately allied; and even between the sexes of the same species a great disparity in size and structure is observable. Where a difference exists, those of the male are more fully developed than those of the female.

The antennæ of the Coleopterous Order usually consist of ten or eleven distinct articulations. The latter number is the most frequent. They are inserted on the front of the head, and anterior to, and rather beneath, the region of the eyes. Their various forms, as characteristic of particular groups of species, will be afterwards described in the body of this work.

The second principal portion of an insect is called the *Thorax.* This important part is itself divisible into three parts: its first segment is called the *prothorax,* or collar; its second the *mesothorax;* and the third the *metathorax* *. These component segments vary greatly in their relative proportions in the different tribes; and the division which is merely rudimen-

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* We notice these divisions chiefly as recognised by the continental naturalists, although, in the descriptions given in the body of our work we usually, in relation to the form or colour of the thorax, describe that organ as a single principal portion, intermediate between the head and abdomen.

tary in one particular group, may be found highly developed in another. Each segment may likewise be distinguished in reference to its inferior, its lateral, and its superior portions.

A single piece constitutes the inferior portion, and is called the *Sternum*. This is not an occasional projection, merely characteristic of certain tribes. It occurs in all insects, and forms a distinct character, though more or less defined, and perspicuous, according to the genus. Each lateral portion is usually formed of two pieces, which, in combination with the sternum, may be named the *pectus* or breast.

Although the general name of thorax is applied to the three segments before named, yet the posterior two, that is, the mesothorax and metathorax, are most dependent on each other, and are always intimately united; while the prothorax, as exemplified in the Coleoptera, is often comparatively free and distinguishable. It is this last mentioned segment which bears the anterior pair of feet, and it considerably exceeds the others in extent. These unite strictly with the base of the abdomen, and serve as the points of attachment to the other pairs of feet. We may add, that the mesothorax is always short and narrow, while the metathorax is frequently spacious, and is longitudinally furrowed in its centre. To the former are attached the second or intermediate pair of feet, and the elytra; to the latter the third pair, and the wings.

Of the superior or dorsal aspect, the only portion we shall here notice is the *Scutellum*, usually of a triangular form, and projecting backwards from the mesothorax, with its point interposed between the basal suture of the elytra. Its apparent position between the wings, has occasioned its being regarded too exclusively as a kind of *point d'appui* in flight. The scutellum was adopted by GEOFFROY as the basis of his arrangement of the genus *Scarabæus*. It is, however, by no means a well-chosen characteristic of the greater divisions in Entomology; for the accurate distinction is not, as is usually supposed, whether the scutellum does or does not exist in a lamellicorn insect, but whether it is or is not apparent *. It occurs very obviously among many of the coleopterous tribes, but is most conspicuously developed in that genus of the He-

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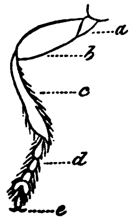
* *Horæ Entomologicæ*, i. p. 9.

mipterous order called *Scutellera*, of which *Cimex lineatus* may serve as an example. Naturalists appear to have erred in regarding this portion as characteristic of the mesothorax alone. It is often greatly developed in the hindmost segment.

Although the elementary or component portions of the scutellum are generally so united as to present a single homogeneous piece, yet, in many instances, their existence is rendered apparent by slight sutures. A careful study of the scutellum, regarded as the principal dorsal portion of the thorax, has led LATREILLE to adopt the following nomenclature of its parts. The anterior portion is named the *præscutum;* it is sometimes very large, and is usually concealed in whole or in part in the interior of the thorax. The second portion is the *scutum;* it is an important element, often strongly developed, and always articulates with the wings, where these exist. To the next piece the original term *scutellum* is applied: it consists of the projecting angular point generally so denominated by entomologists. The fourth and last piece is called the *postscutellum:* it is almost always entirely concealed within the thorax—sometimes united to the internal face of the scutellum, and confounded with it—sometimes free, and not adhering to the other portions, except by its lateral extremities.

It has been noted, that if an insect is more habituated to walking than flying, the breast or lower portion of the thorax is extended, and is furnished with more powerful muscles than the back; whereas if flight is the means of locomotion, an increase of power is observable in the dorsal muscles. The locomotive organs are of course the legs and wings, on which we shall now bestow a brief consideration.

With the exception of the *Myriapoda*, of which LATREILLE (in his *Fam. Nat. du Règn. Anim.*) forms a separate class, insects have only six legs, each of which is composed of the following parts:—The *coxa* or *haunch* (itself consisting of an internal part, called the trochantin, the rotule, and the trochanter *a*), the thigh *b*, the tibia *c*, and the tarsi *d*. Of these last parts, the terminal joint bears the claws or ungues *e*. The anterior pair of feet are in some cases convertible into organs



of prehension, and their tarsi are frequently dilated in the male sex. The number of articulations of the tarsi varies from three to five, and their amount in each limb has been assumed as the basis of the great sectional divisions of the Coleopterous Order, so generally adopted by the continental naturalists. It may be as well to explain the nature of these divisions, as they pervade the whole mass of foreign entomology.

Many extensive families of coleopterous insects are distinguished by *five* articulations to the tarsi, that is, by five joints on each foot, as in the example just figured. All of these fall under the first general section called *Pentamera*, from πεντε, *five*, and μερος, *part*, or *article*.

Another extensive division is characterised by *five* articulations to the tarsi of the two anterior pair of feet, while the posterior or third pair possesses only *four* articulations. All the species so formed belong to the section *Heteromera*, so called from ἑτερος, *different*, the tarsi being dissimilar to each other.

Numerous Coleoptera exhibit the tarsi composed throughout of *four* articulations. These are ranged under the general section *Tetramera*, from τετρα, *four*.

Lastly, many species have not more than three, and some no more than two, joints to the tarsi, and these belong respectively to the sections *Trimera* and *Dimera*. It has even been supposed that an insect exists, the tarsi of which are furnished with only a single joint, and for its reception the section *Monomera* (from μονος, *alone*) has been established. Later and more considerate observation, however, has led to the belief, that both of the last-named sections are resolvable among the trimerous species, and that the supposed absence of the second and third joints arises from their extreme minuteness.

"Nihil notatu dignius videtur," observes Mr FISCHER, "constanti tarsorum insectorum imprimis Coleopterorum formatione, quæ, quidquid etiam naturæ scrutatores quidam contra eam in medium protulerint, methodum ordines insectorum in sectiones vel series minores dirimendi offert tutissimam *." The extreme simplicity, and consequent ease of application, of the sectional rules deduced from the structure of the tarsi, has probably induced the continental naturalists to adopt them more readily than they would have done, had they foreseen the occasional contradictions to which they lead. The fact cannot be disguised, that the system is extremely artificial; for many insects differ in the number of the tarsi, which are yet nearly allied by their general structure and attributes; while it would be easy to shew, that the mere agreement in the number of those parts by no means carries along with it a corresponding relationship in the form of the other more important organs [*]. The truth is, that the articulations of the tarsi differ in some instances even in the sexes of the same species, as may be seen in *Cryptophagus fumatus* and *C. pallens;* and the consequence, as Mr MACLEAY has pointed out, of forming the primary divisions in accordance with their amount, has been, that many genera are separated, and thrown to a great distance from the place which nature has assigned them [†]. While, therefore, the British naturalists have availed themselves of whatever aid these sectional divisions have legitimately afforded, they do not trammel themselves by a uniform adherence to the system independent of its accordance with nature.

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* *Genera Insectorum*, Præf. p. 5.

We have next to consider those other locomotive organs of insects—the Wings. No insect has more than four wings, many only a single pair, and others are entirely destitute of these parts. The Coleopterous Order presents some peculiarities in relation to these organs. The anterior pair consist of a hard or horny substance, similar to the envelope of the thorax, and are called Elytra. When closed, their junction forms a straight central line called the *suture,* which is rather apparent than real in certain species, in which the inferior wings are wanting, and in which the elytra form a single undivided piece. They are convex above, and concave below, are attached to the mesothorax, and cover and protect the genuine wings, which are of a much more delicate structure. These latter, which, in relation to the elytra, are sometimes called the inferior or posterior wings, derive their origin from the metathorax, and are the actual organs of flight. They are membranous and transparent, and, when unemployed, are transversely folded beneath their horny covering.

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[*] "Ce n'est pas assez," says CLAIRVILLE, "pour pallier les frequentes anomalies qui se recontrent, de dire que tel insecte a cinq articles aux tarses quoiqu'on n'en découvre que quatre. Il devroit en effet en avoir cinq d'après la règle qu'on a établie. Cependant ces explications, toutes ingenieuses qu' elles sont, ne peuvent me convaincre, et je ne puis me détérminer à supposer plus d'articles aux tarses qu'on ne peut réellement en decouvrir, en y mettant toute l'attention possible. Le nombre des articles doit être clair, positif et uniforme, sans quoi le charactère est vaccillant. Au reste, je ne disconviendrai pas que sans etre rigoureusement propres à diviser les ordres, ils ne puissent tres-bien servir pour un tableau dans lequel les genres seroient ordonnés selon le nombre des articles des tarses."—*Entomologie Helvetique*, p. 30.

[†] *Horæ Entomologicæ*, part i. p. 6.

One of the laws laid down by M. Straus Durckheim, as regulating organic structure, is the following:—That when one organ governs another, or several others, these follow the march of the dominating organ; and that when the latter disappears, those which were subordinate to it immediately assume their primitive form. This law may be exemplified by the influence of the wings upon the thorax. In proportion as the two pairs of wings change in form, and size, the two segments of the thorax which support them follow the same progression, and become more and more united to each other; but no sooner do the wings disappear in the *Aphaniptera*, than the two segments of the thorax regain their primitive form, and separating from one another, present the same appearance as in *Lepisma*.

The same author, in the introduction to his carefully elaborated work *, has endeavoured to explain the laws which regulate the different changes of structure in passing from one group to another. The most general law in the organization of animals which he has recognised, is, that all the systems of organs are subjected to a constant variation of form, and even of function, while passing from one family to another. The first more special or particular law which he evolves from the subdivision of the former, is the following;—that the organs at one extremity of the scale always exercise a very evident function; whilst at the other extremity they are constantly rudimentary, and without function, and at last entirely disappear. He here distinguishes two kinds of cases. In the first, the organs present themselves at the head of the scale, developed to the highest degree of which they are susceptible, and decrease insensibly, until they arrive at the other extremity of the scale. Thus, for example, the posterior wings of insects are "introduced suddenly" into the organization of that class, at the highest point of perfection in the Coleoptera, where they alone serve for flight. In the Orthoptera and Hemiptera they already begin to divide their function with the elytra, and go on diminishing gradually, until they exist merely as rudiments in the Diptera, where they are represented by the Halteres *: finally, they entirely disappear in the Aphaniptera. In the second instances, the organs do not appear at the head of the scale in their most perfect state of development, and only acquire it by degrees. Such is the case with the elytra, or first pair of wings, which follow a course exactly contrary to that of the inferior wings. They only appear at first as organs slightly accessory to flight, in which state they remain nearly throughout the whole Coleoptera. In the Orthoptera and Hemiptera they already begin to take a very active part in flight, but still preserve their primitive use as wing-covers. In the Neuroptera, particularly the Libellulina, they attain the development of the inferior wings, from which they differ but very slightly.

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* *Considérations générales sur l'Anatomie Comparée des Animaux Articulés, auxquelles on a joint l'Anatomie descriptive du Hanneton*, 1 vol. 4to, *avec Planches*. Paris, 1828.

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* The name of *Halteres*, poisers, or balancers, is bestowed on a pair of slender moveable appendages formed on the hinder part of the thorax in Dipterous or two-winged insects. They are usually regarded as the rudiments of the second or posterior pair of wings, " halteres rudimenta alarum posticarum," as FABRICIUS has expressed it in his *Entomologia Philosophica*. This opinion, however, is believed by others to be founded rather on the position which these organs bear in relation to the anterior wings, than on their connexion with the metathorax, and its different parts. LATREILLE, a great authority in such matters, maintains, that the balancers do not correspond to or represent the second pair of wings, but are rather vesicular appendages connected with two posterior tracheæ of the thorax, and analogous in some measure to the processes which accompany the respiratory organs of the *Aphroditæ*, or those of the aquatic larvæ of *Ephemeræ*, and the genus *Gyrinus*. He founds his opinion chiefly on this, that the inferior wings always take their origin from the lateral and anterior summits of the third thoracic segment, at a very short distance from the superior wings, and always in advance of the two posterior stigmata of the thorax; whilst the balancers are inserted lower down, at the internal extremity of these air-conduits, or close by them.—See LATREILLE's Observations in the 7th and 8th volumes of the *Memoires du Museum d'Histoire Naturelle*.

From this point, they continue to surpass them, until in the Diptera they become the sole organs of flight, and of course, have there attained the highest degree of perfection. Arrived at this culminating point, they suddenly diminish in Hippobosca, and entirely disappear in Pulex.

We come now to the *abdomen*, an important portion in the animal economy. Anatomists in general appear to have advanced from the study of the human frame to that of animals, or at least to have applied to the parts of the latter the same terms which they had previously bestowed upon the former. In so doing, they have been guided rather by the analogy of form than of function, and hence the vague nature of many terms, as applied to the inferior orders, and which, however correct in their original signification, become either obscure or altogether inapplicable in regard to the other classes.

The abdomen, among insects, is that part of the body which is attached to the posterior extremity of the thorax, composed of five or six rings or segments, unprovided with locomotive organs, and always containing within it a portion of the digestive canal. If, as many suppose, its existence depends upon that of the thorax, the entire class of Annelides may be said to be deprived of it, as the thorax itself does not exist in that class. The term *body* is then made use of to designate generally the whole of the animal. Although the abdomen cannot well exist without the thorax, the converse does not appear to hold good, for the latter in many species seems to constitute the whole body. Many of the Myriapoda, such as Julus and Scolopendra, are examples of this; for they are composed of a series of segments, all furnished with feet except the last, which has therefore by some been regarded as the abdomen.

In the Coleopterous Order this portion is usually convex, and of a hard consistence beneath, where it is exposed; but it is soft, and either flattish or concave above, where it is covered by the folded wings and elytra. On both sides of each of its segments, there is a small roundish opening called the stigma, which serves for the introduction of the air for the purposes of respiration.

These are the principal external parts of the structure of

Coleopterous insects. We shall speak of the eyes when we come to treat of the sense of sight.

Their anatomy or internal conformation, has been illustrated of late years by the successful efforts of several ingenious observers. We shall here notice a few of the dominating or most influential organs.

Although naturalists are in use to class the insect tribes as inferior in the great range of organization to the molluscous animals which inhabit shells, there can be no doubt that they are superior in many of their vital functions. Their powers of locomotion, whether as winged, aquatic, or terrestrial creatures, are finely developed, and their perceptive faculties are much more acute. The symmetrical perfection of their forms, and the articulation of the limbs in the insect class, seem also in some measure to connect them with the vertebrated tribes.

The *nervous system* of insects consists of a homogeneous pulp, usually disposed in twelve successive ganglions connected by a double cord. We first observe a double or bilobed mass, which, as it is placed in the head, may be called the brain. It is surrounded by strong muscles, and from its anterior portion, nerves are distributed to the eyes, antennæ, and mouth. Posteriorly, two delicate recurrent nerves proceed towards the dorsal vessel; and, inferiorly, two larger nerves, after having formed by their branching a kind of ring, which embraces the œsophagus, unite in the form of a ganglion beneath the last-named organ. From the posterior part of this ganglion, a pair of nervous cords proceed for a space, and then by their union produce a second inferior ganglion, from which the nervous cords again branch off posteriorly; and so uniting and ramifying from space to space, they extend through the different segments of the thorax and abdomen. The number of these ganglia varies; sometimes they correspond to the divisions of the body, while in many instances they are of smaller amount. When we examine them attentively, we may perceive that in addition to the double and longitudinal nervous cord by which they are connected, they throw off laterally on either side small nervous trunks which divide into branches, and finally ramify over the muscles, the intestinal canal, the tracheæ, and other parts.

This nervous system differs considerably in the larva and perfect insect. In the latter the ganglia are usually less numerous, and the posterior ones appear formed by the close approximation of several others.

The principal ganglia of the nervous system of insects, are usually thus disposed: The position of the upper or cervical ganglion has been already mentioned. The others rest beneath the intestines, ranging along the inferior face of the body. There are three in what may be called the chest; that is, one in the prothorax, which sends nerves to the anterior legs; one in the mesothorax, which supplies the elytra or the upper wings, and the middle legs; and one in the metathorax, which distributes its filaments to the second pair of wings, and the last pair of legs. The other ganglia belong to the abdomen. We may conclude this department of the subject, by observing that insects are characterised by the ganglionic distribution of the nervous system in common with the Crustacea and Arachnides on the one hand, and with the Vermes or worms on the others. But in insects the ganglia are larger and less numerous than in the still lower tribes, and this gives a more decided character of centricity to their nervous system. Indeed, the highest manifestation of this character is usually presented only as the ultimate result of several metamorphoses; so that while the larva exhibits a closer agreement with the nervous system of worms, that of the imago or perfect insect assumes a higher development.

As the nerves are the principal media of sensation in all animals, we shall add to this portion of our sketch a brief notice of the different senses of the insect class.

The sense of *touch* varies remarkably among these creatures, according to the condition in which they happen to exist for the time—their exterior coat, in which the function resides, or at least through which it requires to be manifested, being itself subject to great variation, even among individuals of the same species. When soft, as in the larva state, the skin is extremely delicate in its perceptions, and capable of transmitting the most lively sensations; while in the imago or perfect condition, more especially among the Coleoptera, its harder consistence, renders it chiefly serviceable as a protecting covering. In this case the feet, palpi, and, as many suppose, the antennæ, seem the principal organs of the sense of touch.

The sense of *taste* is very obvious among insects. We see many species, while searching after food, reject or only partially consume whatever is disagreeable or unexpected, while they gloat over a more favourite morsel. The organ in which the sense is placed, is not however so easily determined. Some regard the palpi, and others the pharynx, as its principal seat. That portion of the labium which the French naturalists name the languette or ligula, has also been regarded as exercising the sense of taste. It is certain that distinct nerves are distributed to that quarter, as represented by LYONNET, in his immortal work on the Caterpillar of the Cossus.

The sense of *smell* is exquisitely developed. No sooner has an animal fallen from age or sickness, even on the loneliest and most barren moor, where perhaps no vestige of insect life was previously perceptible, than troops of flies and carcass-eating beetles assemble from all quarters, led by the emanation of the tainted air. It was, in truth, the influence of the sense of smell that in ancient times no doubt gave rise to so many erroneous ideas regarding the origin of insect life. Every animal body in a state of decay being seen to present a crowd of small larvæ or worms, these were regarded as the *produce* of corruption; whereas they resulted naturally, and according to the usual course, from eggs previously deposited by the parent flies or beetles, which had been attracted by the putrid effluvia. It is not 200 years since REDI proved for the first time, by conclusive experiments, that this was true. Bees will discover and hover around a box containing honey, though their prized treasure is screened from sight; and both flies and beetles are so affected by the perceptions of this sense, that even their peculiar and all but unerring instincts are occasionally deceived by its influence. They will deposit their eggs on plants which are characterized by a fetid smell, (for example on the *Phallus impudicus*) misled by the resemblance of their flesh-like odour, which the experience of the sense of sight cannot rectify. The scent of many flowers is cadaverous, and is thus the means of assembling around their deceptive petals, numerous insects, which feed on putrid matter. It is thus that the spathes of the *Arum dracunculus*, and the corolla of the *Stapelia variegata*, are frequently found covered by silphæ, flesh flies, and other species, which not only attempt to feed upon them, but also deposit their eggs in what they conceive to be a fitting station. But the seat of this indispensable faculty is likewise still involved in obscurity. On a subject so difficult of solution, and which can only be solved by a consummate knowledge of anatomical structure, viewed in relation to the uses of physiology, it would not become us to offer an opinion, or do more than report the sentiments of those who are necessarily more experienced than ourselves.

Many agree with Dumeril, in maintaining, that in insects, the sense of smell is effected as among the higher animals, through media in very intimate connexion with the process of respiration ; in other words, that either the tracheæ or stigmatic openings are the seat of its exercise. Others again suppose that, for the exercise of so important a function, a more special and concentrated organ is required; and, proceeding upon the analogical relation of mere position, they regard the antennæ as its seat. These receive the first pair of nerves, and so far correspond to the olfactory organs of the higher animals, which are likewise connected with the brain by means of the first pair. The function is one which is extremely difficult of determination, especially in reference to the singular experiments of Huber on Bees, which go far to prove that the sense of smell, at least in these hymenopterous species, is placed in the cavity of the mouth. Mr Rennie supposes that the antennæ are the ears, and this view of the subject leads us to the sense of hearing.

Hearing is perceptibly acute in some insects, and of more doubtful existence in others. The frequent and various sounds to which many species give utterance, have been adduced in proof of their being endowed with this perception, for we cannot but suppose that the shrill voice of the grasshopper, and the evening song of the cricket, are subservient to some essential end, which they cannot well be if unheard by their blythe companions. The small wood-devouring beetle, called the *death-tick (Anobium)*, answers it neighbour's call as regularly as a cock crows a response to its rival; and **Derham**, when he kept these insects in captivity, by imitating their tiny call, could make them click when he pleased. What is called the voice in insects, is usually produced by the friction of certain hard and horny parts of the limbs upon some other portion of the body of a like consistence. In others it is effected by a rapid vibration of the wings, and a few beetles seem to give utterance to a shrill and sometimes plaintive cry, by rubbing the terminal segments of the abdomen against the curved points of the elytra. This power of voice, as we call it, for want of a better name, is often possessed by the males alone; and as it is used as a call of love in spring and summer, (most obviously so among the Cicadæ), we infer the sense of hearing in the females, and consequently in the class of insects. The precise position of the organ has not, however, been determined in many instances. In the Crustacea it is found at the base of the large antennæ, and **Latreille** has satisfied himself of its existence in a similar situation, in an orthopterous insect called *Gryllus lineola.*

The sense of *sight* is too obvious in this class to require demonstration. The eyes of insects are, however, of a very different nature and construction from the exquisitely formed visual organs of the higher tribes. They consist of two kinds, the *composite* and the *simple.* The latter, known likewise by the name of *stemmata*, are sometimes wanting.

The composite eyes generally form, as it were, the lateral portions of the head. They are either entire, notched, or even occasionally so completely divided by a little corneous stalk, as to exhibit (for example in the genus *Gyrinus*) the appearance of a pair on either side. In other respects, their forms are extremely variable,—their surfaces more or less convex. The structure and composition of the eyes of insects has been carefully studied and explained by **Leewenhoeck**, **Swammerdam**, **Cuvier**, and, more lately and laboriously, by **Marcel de Serres**. We shall here avail ourselves of the *resumé* given by **M. Victor Andouin** *. In the eye of an insect, we observe, 1: A cornea, (convex in proportion to the carnivorous habits of the species), transparent, hard, thickish, generally encased in a groove of the head, and exhibiting many thousand regularly disposed hexagonal facettes, each of which is in itself a perfect eye. These are sometimes so numerous, that not fewer than 34,650 lenses have been counted in the head of a butterfly. 2 : An opaque, slightly liquid matter, variously coloured, frequently deep violet or black, but sometimes red or green, tenaciously adherent to the inner face of the cornea, and distinct from the deep black varnish of the choroid. It is by no means rare to observe various colours united in the same eye, which then appears beautifully mottled, as in many species of the Orthopterous, Neuropterous, and Dipterous Orders. These tints, however brilliant in the living state, speedily vanish after death. They are always owing to this peculiar coating of the cornea. 3: A true choroid, covered by a dark varnish, which may be regarded as a *pigmentum nigrum.* The lynx-eyed Swammerdam failed to distinguish this coating from that of the cornea, but in the opinion of Marcel de Serres it is really different. The choroid and its pigment do not always exist in insects. They are wanting in the Blattæ, and in all the lucifugous or light-shunning species, such as those of the genera Blatta, Tenebrio, and Pedinus. In these cases, it has been remarked, that the covering of the cornea is much deeper than usual. The choroid membrane is fixed by its circumference to all the margin of the cornea, of which it follows the contour, and is intimately connected with the tracheæ, which are there so numerous. 4: Air-vessels, which play an important part. They take their rise from larger trunks, which are situated in the head, and form around the eye a circular trachea, which sends forth an infinity of branches, producing by bifurcation a number of isosceles triangles. These triangles, of which the base is outwards, are placed around the optic cone, and receive in each angular interval which separates their summits, a nervous filament, which traverses the choroid, and reaches the external surface of the covering of the cornea. The assemblage of tracheæ and nervous threads forms at the circumference of the eye a peculiar kind of net-work, of which the aspect is beautiful to look upon. The tracheæ themselves are so abundant on the choroid, that that membrane appears to be composed of them, and it may also be noted, that in those genera in which the choroid is wanting, the circular tracheæ is likewise absent *. 5: Nerves arise from a principal branch, which, after proceeding immediately from the brain, (or upper ganglion), is either encompassed by a little circular trachea, or traverses the fibres of the abductor muscle of the mandibles. This branch soon augments in volume, and forms a kind of cone more or less extended, of which the base is towards the transparent cornea. Numerous nerves proceed from that base, mingle with the tracheæ of the choroid, traverse both that membrane and its pigment, penetrate the lining of the cornea, and finally terminate each on a facette of the transparent cornea, so that the nervous filaments are thus immediately in contact with the light, which reaches them after having traversed only the last named organ. This disposition of the nervous threads, which thus constitute as many small retinæ as there are facettes in the cornea of the eye, is very distinguishable in Libellula, Truxalis, and Gryllus. The eyes of insects, then, contain no humours, properly so called, neither vitreous nor crystalline; and vision is consequently much more simple with them than with the vertebrated tribes, in which the nerves are placed deeper in the eye, and do not receive the rays of light till these have passed through media of different densities.

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* *Dict. Class. d'Hist. Nat.* t. viii. p. 554.

The simple or stemmatic eyes of insects are usually three in number, and are placed on the crown of the head, between the genuine organs of sight, from which their structure differs. In spite of their extreme minuteness, MARCEL DE SERRES has succeeded in detecting the following component parts: 1st, A transparent cornea formed by an external membrane, hard, convex externally, and smooth, that is, exhibiting no appearance of facettes: 2d, A variously coloured matter, which lines the internal face of the cornea, but which is perhaps not essentially distinct from the varnish of the choroid: 3d, A kind of choroid, rather thick, more extended on the surface than the cornea itself, sometimes of a black colour, more frequently red,

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* MULLER and others appear to entertain a different view from that given above. The subject is one of considerable complexity, and our present limits prevent our entering into its various and sometimes contradictory details. We refer the curious reader to a series of papers on the visual organs of Insects and Crustacea, in the 4th vol. of the *Naturalist's Magazine*.—See also *Dict. Class. d'Hist. Nat.* t. viii. p. 555.

and occasionally of a peculiar whitish hue: 4th, Tracheæ, which do not derive their origin from a circular air-vessel, and do not as it were constitute the choroid, but appear to be distributed over its surface: 5th, Nerves proceeding either directly from the brain or upper ganglion, or from another more considerable nerve, according as the simple eyes are separate from each other as in perfect insects, or closely approached as among larvæ. The principal character of these simple eyes consists in this, that each is a single organ, whereas the composite eyes, as the name imports, are formed by the union of many. The one kind is most characteristic of the larva state, the other of the perfect insect; but numerous Orders, even in the last mentioned condition, possess both organs. No coleopterous insect, however, exhibits simple eyes after attaining completion.

Of the respiratory system in insects.—The respiratory organs of this class are composed of *Stigmata*, *Tracheæ*, and *Bronchiæ*. The first, called also spiracles or breathing pores, consist of small perforations of various forms, placed along the lateral portions of the body, and generally encased externally in a small corneous ring. These stigmatic openings occur both in the thorax and abdomen, and lead inwards to the tracheæ. Their number varies according to the species, and even in the same species according to the temporary condition of the individual. They are wanting on the second and third segments of the body of the larva; and as it is from these segments that the wings are developed, M. DE BLAINVILLE has been induced, probably by that circumstance, to regard the organs of flight as reversed and expanded tracheæ. The existence, however, of stigmatic openings on the thorax of the perfect insect, simultaneously with the wings, militates against this theory,—for if these parts were convertible, would they not be likewise each exclusive of the other?

Parallel with the sides of the body of most insects, and extending its whole length, run two cylindrical tubes which communicate with the spiracles, and give issue, at points opposite to those organs, to other tubes, the ramifications of which are distributed over all the membranes, penetrate the muscles, and *pervade* even the legs and wings. They also envelope the dorsal vessel and digestive organs, and demonstrate that the ultimate aim of respiration is assimilation, or the increase and reproduction of organic molecules, by the decomposition of food. The first of these tubes are called the Tracheæ—the latter the Bronchiæ. This structure, however, cannot be regarded as universal, as, in many of the lamellicorn beetles, the bronchiæ spring directly from the spiracles, the interior mouth of which is lined by a membrane from which they proceed.* But a volume would scarcely suffice to describe the beautifully varied features of the respiratory system in insects. Among those tribes especially which pass their early stages under water, the changes in form and position in these organs cannot be sufficiently admired. Several common species of gnat, the larvæ of which abound during the summer season in all our ponds and marshes, will afford a familiar illustration. When one of these is examined, a singular tunnel-shaped organ, terminating in a radiated point like a star, will be perceived, forming an angle with the last segment of the body but one. In the interior of this organ is a tube, which conveys the air to the tracheæ, and communicates with the atmosphere by means of several perforations in the centre of the star. The diverging rays of the star suspend the animal at the surface of the water, with its head downwards, till it wishes to descend. It has no sooner assumed the pupa state, than the respiratory tail disappears, and the insect (still an inhabitant of the water) then breathes through two projecting horns, each resembling a little cornucopia, which proceed from the upper part of the trunk. Ere long, the skin of the pupa bursts asunder, and the perfect gnat or winged insect makes its appearance, with neither caudal nor thoracic appendages, but breathing by means of numerous lateral pores (the stigmata above mentioned), after the usual manner. The *rat-tailed worm* in this respect is still more extraordinary. In the larva state, it breathes through a tail formed of retractile tubes, like a telescope, and capable of being extended many times the length of the body. This also terminates in a star-like process, which, when viewed in a strong light, forms a perceptible dimple in the surface of the water; and as the body of the insect lies in the mud below, the tail is contracted or extended according to the varying depth of its stagnant habitation. On assuming the pupa state, in which it is no longer an aquatic animal, the respiratory tail is cast off, and its function performed by four horns, which spring from the upper part of the thorax. It afterwards becomes one of those bee-like flies so remarkable for the rapid vibratory movement of their wings, by which, during calm sunshine, they are often seen suspended in the air like hawks, without any perceptible motion. In this last stage, respiration is carried on by spiracles or breathing-pores.

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* *Introd. to Ent.* vol. iv. p. 61.

We shall next endeavour to explain the nature and construction of the organ known by the name of *dorsal vessel.*

When an insect is dissected with due precaution from its inferior surface, and we remove the nervous system which first presents itself, and then the intestines and other viscera, we shall observe running along the back a peculiar vessel, of which the most obvious powers are those of contraction and dilatation. It is of a cylindrical form, narrowed at either end, and extends from the head to the anal extremity. This constitutes the *heart,* sometimes so called, of the class of insects. A closer examination shews that it is composed of two membranes, one internal and muscular, the other external and cellular, and pervaded by a close interlacement of tracheæ or air-vessels. When opened, its interior presents a transparent coagulable liquid, which dries rapidly, and then exhibits the aspect of gum, of a colour seldom deeply defined, but sometimes greenish, orange-yellow, or sombre brown; masses of fat frequently surround this vessel, and partake of the tint by which it is pervaded. If, as MARCEL DE SERRES has noted, the *dorsal vessel* (for so this organ is often named), were a genuine heart, or centre of a circulating system, it would be necessarily open at one or other of its extremities, and would present vascular ramifications in certain points of its extent. But according to the minute and laborious investigations of the last named author, no such openings are observable. The same view was taken by SWAMMERDAM,—and LYONNET, so unrivalled in his examination of the structure of insects, was foiled in his attempts to demonstrate the ramifications of the dorsal vessel. COMPARETTI, no doubt, took another view of the subject, and if the assurance of his readers was equal to his own, less suspicion would exist of the possibility of his having mistaken biliary for sanguineous vessels.

Anatomists, however, are greatly divided in opinion regarding the essential nature of this organ. It has been dissected and injected by MARCEL DE SERRES in a variety of species, but in none could he discover its divisions or ramifications. Even when he removed it entirely from the insect, no drop of the liquid which it contained was observed to escape, which he thinks it must have done by the cutting away of open vessels during dissection, had these existed. The *beating* of this dorsal vessel was not explicable otherwise than by the contraction of its tissue, or the movement of the fluid which it contained,—and such movement was not itself conceivable, except in the case of circulation, which the alleged closure and non-division of the organ forbade us to suppose. Its contractions also appeared irregular and scarcely ever isochronic, that is, the same number of pulsations, if they may be so called, did not take place in an equal time. They varied singularly in different species. Thirty-six per minute were counted in the caterpillar of the *Pavonia major*, eighty-two at least in grasshoppers, and a hundred and forty in one of the ground-bees. While endeavouring to discover the cause of these contractions, MARCEL DE SERRES came to the conclusion, that they bore a relation, 1st, To the quantity of adipose tissue by which they were surrounded; 2d, To the energy of the muscular fibres which were inserted on the vessel, and were the means of fixing it to the rings of the abdomen; 3d, To the number of tracheæ or air-conduits by which it was supplied. He was not of opinion that the nerves exercised any strongly marked influence on these contractions, although we know that special nerves are directed to the dorsal vessel. The fact, however, which he deemed the most clearly established, was the influential action of the muscles. When any of these were removed, the pulsations became less frequent;—on a farther removal they still diminished, and when the muscles were almost all withdrawn, the pulsations stopped. The appropriate function of this disputed organ, according to the last named author, is the secretion of fat. Baron CUVIER also denies to it the character of a genuine heart.

Meckel and Herold, on the other hand, regard the dorsal vessel as a heart, and they conceive that the use of its movement is to agitate the fluid contained in the cavity of the insect's body; but they do not admit the existence of posterior or anterior openings for the reception or rejection of that fluid. It is long since Lyonnet informed us, that it contained a gummy matter of an orange colour, and some recent observations have led Latreille to admit the existence of certain very minute accessory vessels. In addition, however, to the fact, that this circulation must be extremely partial, insects would still greatly differ in that respect from the Crustacea, if, as these writers suppose, the blood does not return to the heart. Herold is of opinion, that the triangular muscles of the dorsal vessels serve for its dilatation, while the systole movements are effected by the muscular fibres which form the proper tunic. Straus is also of opinion, that the dorsal vessel is the true heart in the class of insects, and that it serves, as in the higher animals, as the motive organ of the blood, which, however, instead of being contained in vessels, permeates in the general cavity of the body. According to his views, it terminates anteriorly by a single unramified artery, which conveys the blood to the head, where it pours it out, and from whence it returns again to the abdomen, to re-enter the dorsal vessel. He thus limits the circulating system of insects to a single artery without branches (there are not any veins); and he combats the sentiments of Herold regarding the muscular nature of the wings of the heart, which he maintains are only simple fibrous ligaments by which it is maintained in its proper place. The heart itself, that is the abdominal portion of the vessel, he describes as divided interiorly into eight successive chambers (as in the common cockchaffer, *Melolontha vulgaris*), separated from each other by two convergent valvules, which permit the transmission of the blood or circulating fluid from behind forwards, and from one chamber to another, up to the artery which conducts it to the head, but prevent its retrograde motion. Towards the lateral and anterior portion of each chamber are two transverse fissures, which communicate with the abdominal cavity, and through which the blood contained in the latter *enters the* heart. Each of these apertures is provided internally with a little semicircular valve, which presses on it during the systole of the organ. When the posterior chamber dilates, the fluid contained in the abdominal cavity penetrates into it by the transverse fissures, called *auriculo-ventriculaires* by M. STRAUS. When the chamber contracts, the blood, unable to return into the abdominal cavity, forces the *inter*-ventricular valve, and passes into the second chamber which dilates to receive it, along with an additional quantity which enters by the true auriculo-ventricular openings. The second chamber then contracts in a similar manner, and forces the fluid into the third, which at the same time also receives a supply from the lateral openings,—and thus the blood is forced from one chamber to another by successive contractions, till it reaches the artery. These are said to constitute the movements so distinctly perceptible through the dorsal skin of many caterpillars.

The reader will be able to judge, from the preceding notices, of the diversified opinions still entertained regarding the circulation of the blood in insects. We shall conclude with a short account of Dr CARUS's observations, which many consider as the most satisfactory and conclusive which have yet been published on the subject. Mr SPENCE, the accomplished coadjutor of Mr KIRBY, having had the advantage, at a pretty recent period, of witnessing some of the most striking facts on which the Dresden physician rests his views, transmitted an account of them to a well-known and excellent English periodical. " The first insect," he observes, " to which Dr CARUS directed my attention was the larva of *Ephemera vulgata* (or an allied species), in which, near to the branchiæ, and parallel with each side of the body, was very distinctly visible a constant current towards the tail, of oblong globules, swimming in a transparent fluid, propelled with a regular pulsating motion; and, on cutting the body of the larva across near the tail, these globules were most plainly seen pushed out of the divided vessels in a distinct mass, which increased at each pulsation. I cannot express the pleasure which it gave me to see thus clearly this ocular demonstration of one of the most important physiological discoveries of modern times; and my gratification was heightened by the next object which Dr CA-

RUS placed before his microscope, viz. a specimen of *Semblis viridis*, in which precisely the same phenomena, but, if possible, more clearly, were seen in the nervures of the wings and in the antennæ, in both which the constant current of globules was most apparent; and in the former, the sudden turning of these globules at the apex of the wing, out of the exterior nervure into a central one, with which it joins and forms an acute angle, was equally curious and striking. On cutting off the end of the antennæ, precisely the same emission of globules (which soon assume a greenish tint) took place as in the former case, forming a mass which was increased with a sudden gush at each pulsation [*]." The chief point to be attended to in the manipulation of these microscopic experiments, is to place the specimens on the slip of glass, in a drop of pretty thick gum-water, which confines their too agile movements, without affecting the transparency of the medium.

Insects are abundantly supplied with an adipose substance or fatty matter, which may be mentioned in this place with the more propriety, as many consider it a secretion from the dorsal vessel. It is spread over the viscera, and in the splachnic cavities, and although its aspect varies, it seems to consist essentially of membranous woofs, in some cases divided into shreds, in others spread over the intestines, and against the sides of the abdomen, and containing pouches filled with a homogeneous pulpy matter, sometimes in an oily condition, and offering all the characters of grease. Much more of it is observable among larvæ than in perfect insects; and this observation leads us to a knowledge of its use. It is particularly plentiful just before an insect is about to undergo its metamorphoses; and as it almost entirely disappears on the completion of those signal changes, we naturally conclude that it has served in the production or development of the newly acquired organs. This is rendered the more probable, when we consider, that, during the intermediate or nympha state, the insect abstains from food, and is therefore necessarily dependent on some internal reservoir. It is analogous, in fact, to the store of fat which is known to pervade the system of hybernating animals before they consign themselves to their winter sleep.

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[*] *Magazine of Natural History*, vol. iii. p. 46.—See also the German memoir by Dr CARUS on the circulation of the larvæ of neuropterous insects (Leipsic, 1827). The English reader may consult Mr GORE's Translation of CARUS's *Introduction to Comparative Anatomy*, Appendix to vol. ii. *p. 392.*

In regard to the nutrition of insects, our opinions must be in a measure regulated by the sentiments which we may adopt as to the functional uses of the dorsal vessel. We need scarcely observe, that, in all the higher animals, and in most of the invertebrated tribes, nutrition is effected through the medium of the blood, which, propelled by the heart, circulates through the entire system, and reaches every organ, after having been submitted to the action of the air in lungs or gills. CUVIER thinks it is carried on among insects by imbibition. The alimentary canal elaborates a fluid which transudes through its coats, and flows into the cavity of the body. There the various organs, such as the muscles, the nerves, and many secreting vessels, absorb from that fluid nutriment whatever molecules are best adapted to their individual purposes. Those who look upon the dorsal vessel as a true heart, which dispenses a circulating fluid to the remotest ramifications of the wings and tarsi, will place less confidence in this particular view. However, it is certain that the secreting vessels are characterised by a structure entirely appropriate to the functions which we have just assigned them, their surface being obviously furnished with numerous pores, or small absorbent mouths.

The Digestive system in insects naturally forms our next subject of consideration.

The earliest, most general, and perhaps the only indispensable function of animal life, is that of nutrition. But its materials are so different, and their modes of reception so various, that the exercise of this function by no means necessitates the existence of a mouth, a stomach, or an alimentry canal; for an increase of parts may be effected even through the medium of imponderable or elastic fluids, and by imperceptible and superficial pores *. The digestive organs of insects are, however, in general rather complicated, and a great variety of parts are brought into action. The more external portions, or those of the mouth, have been already described. We shall

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* *Encyclopædia Britannica*, 7th edit. vol. iii. p. 183.

therefore at present confine our observations to the *intestinal canal*, and the *biliary* and *salivary vessels.*

It is natural to suppose, that, in a class so extensive and varied as that with which we are now engaged, a corresponding diversity must exist in the form, development, and number of the parts which constitute the intestinal canal. It is always so far tubular, and open at either end; but in some it is straight, and of the length of the body; in others it is bent, and longer than the body, while, in many, it is tortuous, or twisted on itself in numerous convolutions, and consequently of great extent. In general, its length corresponds in a certain measure with the nature of the aliments—such insects as feed on vegetable matters having a longer, and such as feed on animal substances a shorter canal. In some, it is of equal diameter throughout; in others, the breadth of special portions varies; and there are many dilatations and restrictions, known by various names. It even differs greatly in the same species, according as the individual exists in the larva or imago state.

The texture of the intestinal canal in insects is not the same in all the parts of its extent; but, on a careful examination, it is found to exhibit throughout three tunics, more or less distinctly marked. Of these, the first is external, with a membranous aspect—the second is of course intermediate, and muscular, with its fibres diversely directed—the third is internal and mucous. In its more complicated state, it exhibits the following parts:—1st, A *pharynx;* 2d, An *œsophagus;* 3d, A *crop;* 4th, A *gizzard;* 5th, A *chylific ventricle;* 6th, *Intestines*, which may be considered in subdivision as the small intestines, the great intestine or cæcum, and the rectum. The following may be regarded as the usual process of transmission:—The mouth having seized and chewed the food, transmits it to the pharynx, into which salivary vessels sometimes open. It then passes into the œsophagus, of which the muscular nature occasionally produces by its action a peculiar impression, and is next transmitted to the crop, which converts it into a homogeneous pulp. This is introduced into the gizzard, of which the sides, being armed with teeth, complete its trituration. In the form of a kind of paste, it is now received by the chylific ventricle, where it undergoes the action of the bile, is converted into chyle, and thus supplies the nutritive fluid, which, passing through the coats of the ventricle, spreads over the splanchnic cavity, and pervades the whole of the organs. The residue is received by the small intestine, then by the great intestine, in which it remains for some time, and finally by the rectum.

We cannot here enter into a detailed description of these various parts. Suffice it to say, that the *pharynx* is sometimes difficult to distinguish as a distinct feature. It may be regarded as an anterior dilatation of the œsophagus. The *œsophagus* itself is a conduit varying in length, which traverses the prothorax, and sometimes extends beyond it: in other cases, it is so short as scarcely to pass beyond the region of the head. Its texture is musculo-membranous: it opens into the crop, or, if that is wanting, into the gizzard, or even into the chylific ventricle, if both of these are absent. It is at the origin of the œsophagus that the nervous system formerly described constitutes a ring, by sending forth two branches which unite on the inferior face of the body. The *crop*, which is by some called the stomach, is essentially nothing more than a dilatation of the œsophagus. It is in this portion of the internal structure that the honey collected and disgorged by bees is for a time contained, and it also serves as the reservoir of the darker and less savoury fluid which so often flows from the mouths of the carnivorous kinds. The *gizzard* is chiefly characterised by its singular internal structure, which is furnished with moveable pieces of a horny texture, provided with ridges or bristles pointed in all directions, in the form of combs or brushes. The *chylific ventricle*, which corresponds to the *duodenum* of MARCEL DE SERRES, and the *stomach* of RHAMDHOR, is a very constant organ among insects, although its form and character are extremely various. It is not garnished interiorly with triturating organs, either muscular or corneous, but it is furnished with a valvule at the point of its junction with the intestine. One of its most curious characters consists in its being sometimes villous on the surface, that is, covered by a quantity of little tubes, named villosities by CUVIER, and papillæ by DUFOUR. The functional uses of these parts are differently construed by physiologists. CUVIER inclines to think that they draw from the abdominal cavity a gastric fluid, which they pour into the ventricle to aid digestion. **Marcel de Serres** partakes of the same opinion, and regards the papillæ as the superior hepatic vessels. **Dufour**, however, does not consider them as analogous to the biliary vessels, but as culs-de-sac which receive the alimentary fluid, and, after its conversion into chyle, transmit it to the abdominal cavity. The *intestines* form an extended portion of the canal. Their extractive or absorbent powers, as alimentary organs, are confined to their upper portion.

We shall next devote a few lines to the *biliary vessels*. That peculiar fluid called bile, seems equally indispensable to the digestion of insects as to that of the higher animals; but the organ which secretes it is very different. In the former class, it has no longer the appearance of a gland, but consists of more or less numerous vessels of variable length, fixed, for the most part, by a single extremity, but not unfrequently by both ends, to the intestinal canal, and floating, as it were, in the abdominal cavity. These vessels are often rolled on themselves, and interlaced by numerous tracheæ and slender nervous filaments. They are never wanting in insects, and they exist equally in the larva state, as in the perfect condition. They are delicate tubes, composed of a thin and pellucid membrane, on which certain transverse foldings produce a somewhat varicose appearance. They contain a liquid, sometimes limpid and colourless, but usually varying from yellow to brown. It is bitter, and exhibits all the characteristics of bile. The vessels themselves vary in amount from two, four, six, to an almost countless number.

The *salivary vessels* consist of floating tubes, which open about the pharynx, and furnish a liquid to assist in deglutition. They are sometimes wanting, or imperceptible, and are more general, as well as more highly developed, among the suctorial than the masticating tribes of insects. The receptacles which supply the silk used by spinning caterpillars, are by many regarded as analogous to salivary glands. We do not conceive it necessary to enter into any further details regarding the structure and physiology of the class with which we are at present engaged *.

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* *Whoever inclines* to enter deeply into these subjects, will find in

As we have had frequent occasion to refer to the metamorphoses of insects, it may be as well briefly to explain in what these essentially consist.

"Were a naturalist," observe Messrs KIRBY and SPENCE, "to announce to the world the discovery of an animal, which, for the first five years of its life, existed in the form of a serpent; which, then penetrating into the earth, and weaving a shroud of pure silk of the finest texture, contracted itself within this covering into a body without external mouth or limbs, and resembling, more than any thing else, an Egyptian mummy; and which, lastly, after remaining in this state, without food and without motion for three years longer, should, at the end of that period, burst its silken cerements, struggle through its earthy covering, and start into day a winged bird—what think you would be the sensation excited by this strange piece of intelligence?" Yet the difference which exists between the sometimes repulsive aspect of a creeping caterpillar and the consummate beauty of the gorgeous butterfly to which it gives existence, is as remarkable as any supposable change from one form of animal life to another.

All insects proceed from eggs, either previously deposited by the female parent, or, as in the case of the so-called viviparous (strictly ovo-viviparous) kinds, hatched within the body of the mother. Their first condition is that of larva, which, according to the views of SWAMMERDAM, contains within itself the germ of the future perfect insect, and those various envelopes, each of which, successively developed, becomes external and apparent, by the casting off of that by which it was preceded. According, however, to the more recent doctrines promulgated by Dr HEROLD, the successive skins of the caterpillar, the case of the pupa, and the members of the perfect insect (except the sexual distinctions, which he perceived even in the newly excluded larvæ), do not pre-exist as germs, but are formed successively from the *rete mucosum*, which itself is formed anew upon every change of skin, from what he denominates the blood or the chyle, after it has passed through the

Messrs KIRBY and SPENCE's *Introduction*, not only a very full and able account of the structure and functions of the various organs of insects, but also such references to the best informed writers as will unfold an ample field for further study and reflection.

pores of the intestinal canal into the general cavity of the body, where, being oxygenated by the air-vessels, it performs the nutritive functions of blood. These proceedings, as usual, are attributed to a *vis formatrix*—a term of most convenient application where the mysterious workings of Nature are but dimly seen, or vaguely understood. But, whatever may be the mode or principle of development, we know that insects exist in the four following states—the *egg*, the *larva*, the *pupa*, and the *imago*, or perfect condition.

The first stage of *life*, properly so called, is that of larva, in which existence is usually more prolonged than in any other, and in which it does nothing but eat voraciously, and increase rapidly, with intervals of repose, occasioned by repletion. In this state, it is entirely sterile. In the course of, and towards the termination of the larva state, that peculiar internal secretion, the caul, epiploon, or greasy matter formerly mentioned, is observed to increase, and the insect then assumes the pupa state, which is usually one of inaction and apparent torpidity. Ere long, the skin of the pupa bursts asunder, or the wings and members become sufficiently developed for active exercise, and the insect assumes the perfect state, as exemplified in bees, beetles, and butterflies, all of which proceed from a worm-like larva. In this condition, they are usually less voracious, their principal object and occupation being the preservation or continuance of their kind.

All insects, however, do not pass through these transformations. Most of the apterous kinds issue from the egg in a form very similar to that which they maintain throughout their after lives; and even those that are subject to such signal changes, differ considerably in the nature and degree of metamorphosis to which they are subjected. Many of the winged kinds experience no other change than the reception of the organs of flight, and are therefore said to undergo a *demi-metamorphosis*. Their larvæ resemble the perfect insect, with the exception of the want of wings. Their pupæ merely differ from the larvæ, by exhibiting the rudiments of those organs, the eventual development of which produces the completion of the perfect insect. Such are the grasshopper and locust tribes, in which the pupæ continue to exercise their locomotive powers, and ordinary vital functions. Those insects which undergo a *complete metamorphosis* are changed from larvæ into motionless and inert pupæ, and this mode of transformation presents different gradations. The pupæ, or nymphs, as they are often called, of the Coleoptera, and several other orders, exhibit their external members in close approximation to the body, but *free*, and uncovered by any general membrane. But among the Lepidoptera, such as butterflies and moths, a somewhat elastic, but firm, and sufficiently solid skin or integument, is moulded over the entire body and its various members, of which the form and outline are distinctly impressed upon its surface. These were called *pupæ obtectæ* by Linnæus. Dipterous flies, again, are covered in their pupa state by small simple cases or egg-like shells, through which the form or proportions of the parts are in no way discernible. These were termed *pupæ coarctatæ* by the great Swedish naturalist.

The *geographical distribution* of insects in general, is a subject of too difficult and complex a nature to admit of being worthily treated in this introduction. We shall merely notice a few insulated facts. It does not appear that the climates of insects, or those peculiarities of temperature, and other physical attributes, under which particular groups or species appear to predominate, have been as yet studied in connection with our imperfect knowledge of isothermal lines. Mr KIRBY has stated, that in Greenland every order of insect has its representative, except Orthoptera and Hemiptera; but in Melville Island, besides these deficiencies, neither coleopterous nor neuropterous species exist, or at least were observable; and even the mosquito, that shrill tyrant of the Lapland plains, appeared to have ceased from troubling along those hyperborean shores. OTHO FABRICIUS resided six years in Greenland, and, during that period, he collected only sixty-three species of the insect class, properly so called. In the still higher latitudes of Winter Harbour, where Sir EDWARD PARRY sojourned, only six species were collected from the beginning of September till the August following. The most northern locality of any insect yet known, is that of the *Aphis borealis*, taken in latitude 82° 26′ 44″, about 100 miles from the nearest land *.

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* This species was found in the boat during the last day of Sir E. PARRY's attempt to reach the North Pole over the ice. There was no

It is probable, however, that the geographical distribution of many northern species is still unknown. It was formerly supposed that in Iceland there was none, and that even in Norway there were very few, and their absence from these countries was attributed to excess of cold. This opinion, however, was contradicted by HORREBOW, so far as Iceland was concerned; and OLAFSEN and POVALSEN, during their sojourn there, collected 200 different species in one small valley. It must indeed be borne in mind, that insects can escape the extreme of cold, not only, as Mr MACLEAY observes, by passing certain periods in the *pupa* or torpid state, but also by being, while in that condition, usually buried in the earth, where they are greatly protected from the rigours of the winter season. "What they chiefly require, is the presence of heat during some period of their existence: and the greater, within certain limits, is the heat, the more active will be their vital principle. On the American continent, the extremes of heat and cold in the course of the year are, as is well known, incomparably greater than in places of the same latitude in Europe. We may therefore readily conceive how particular families of insects will inhabit a wider range of latitude in the former country than in the latter. We also see how insects may swarm in the very coldest climates, such as Lapland and Spitzbergen, where the short summer can boast of extraordinary rises in the thermometer; because the energy of the vital principle in such animal is, within certain limits, proportionate to the degree of warmth to which they may be subjected, and escapes in a manner the severe action of cold [*]." It is on these principles that Mr MACLEAY accounts for what certainly at first seems an extraordinary circumstance in the geography of insects; namely, that their tropical structure extends much farther north in America than in Europe—that is, in a manner directly the reverse of that which has been noticed by botanists to occur in the vegetable kingdom. For example, the *Chamærops humilis*, a species of palm, occurs along the southern shores of

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vestige of vegetation around the adventurous party, and we think it more than probable that the forlorn insect had been carried *nolens volens* from a somewhat more southern quarter.

[*] *Horæ Entomologicæ*, part i. p. 45.

France, in Lat. 44°; while, on the eastern coasts of North America, the hardiest of the family, *C. palmetto*, does not advance beyond the 34°; but if we examine *Copris carnifex*, *Cetonia nitida*, *Rutela* 6-*punctata*, and other coleopterous insects from the neighbourhood of New York, and compare them with species of the same families from Brazil, we shall find their difference of structure infinitely less than that which would result from a comparison of the entomological productions of the environs of Madrid with those of the banks of the Congo *.

A slight consideration of the subject suffices to shew that certain differences in the relative intensities of summer and of winter must exercise a strongly modifying power on the influence of mean annual temperature, even in countries where that temperature is one and the same. "Several fruits, as the olive and grape, as well as the different kinds of corn and other annuals, depend more on the heat of summer than of the whole year; while others, impatient of cold, and not requiring great heat, have their range more influenced by the temperature of winter. Now, it is almost an universal rule, that of two places whose mean temperature is the same, that nearest the sea, and more particularly a western sea, has a temperate summer, and a milder winter. Hence the inland situation is better adapted to the growth of corn and fruits, the maritime one to the preservation of tender plants. In Europe, the northern boundary of the vine and olive rises as we go eastward, though in so doing, we encounter a lower mean annual temperature. The *Arbutus Unedo*, *Sibthorpia europæa*, *Erica ciliaris*, &c. rise in a westerly direction †." Whatever vegetation requires the absence of extreme cold, rather than the presence of extreme heat, will probably extend itself in a tropical form more towards the poles, on a dry continent, than on a moist or marshy one. Tropical plants, therefore, will thrive better in Thibet and other inland parts of northern Asia, than they would do if transported to positions of the same latitude in America; for in the latter country the extremes of heat and cold are too distant from each other. Thus, the vegetation of Canada does not correspond either in its general character, or its amount of species, with that of the corresponding latitudes of France *.

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* *Horæ Entomologicæ*, part i. p. 45.

† Watson's *Outlines of the Geographical Distribution of* British Plants. (Printed for private circulation) Edinburgh, 1832.

Mr Macleay admits, that although, in his opinion, the insect tribes suffer less in cold climates than plants, for the reasons which we have already stated, it does not therefore follow that the prevalence of cold has no effect in relation to the destruction, or rather, we should say, the prevention, of insect life. In truth, the diminution of the number of species becomes very conspicuous as we advance towards the poles. But this the learned author of the *Horæ Entomologicæ* supposes to be owing rather to the short continuance of the summer warmth, than to the lowness of its existing degree. In accordance with this view, we certainly find that many insects, such as gnats, mosquitoes, &c. which pass their larva state in water, thus avoiding the external cold, and whose existence in the perfect state being naturally ephemeral, must therefore suffer little from the shortness of summer, are no where more troublesome than among the moors and marshes of the north. On the other hand, the number of *Coleopterous* species, which being naturally longer lived, require a greater continuance of warmth, is sensibly diminished amid those dreary wastes. We have already observed that none of that order occur in the extreme northern land of Melville Island. *Dytiscus marginalis*, however, an aquatic beetle well known throughout Great Britain, occurs in the waters of Greenland, and extends over the whole of Europe. Another species of the same genus, *D. griseus*, is not only spread over the south of Europe, and most of the countries adjacent to the Mediterranean, but is also found in Bengal. The genus *Calosoma* is very widely spread. Captain Frankland took *C. calidum* during his Arctic journey; *C. laterale* and *curvipes* inhabit tropical America, while *C. chinense*, as its name imports, is found in China. Mr Macleay possesses a specimen from New Holland, and *C. retusum* was captured in Terra del Fuego. The *Coccinellæ* occur in almost all countries, from pole to pole †. The *Silphidæ* and *Dermestidæ* prey on carcasses wherever the solar influence is of sufficient power to produce putrescence; but the brachelytrous beetles (genus *Staphylinus*, &c.) have undoubtedly their metropolis or centre of dominion in the temperate zone, and more especially within the British islands, for while De Jean, in his general Catalogue, gives only 434 species, Mr Stephens enumerates above 750 native kinds. This apparent excess may, however, partly arise from the great attention which has been paid in this country to the collection of the minuter sorts, which are frequently neglected in foreign lands, for the sake of the more shewy and imposing species. The genus *Onthophagus* is native both to the old world and the new, to the temperate as well as the torrid zone; while *Copris*, its near ally, is more abhorrent of cold, *C. lunaris*, which extends northward into Sweden, being the only recorded species found in Europe, out of Spain *. Latreille, however, laboured under a misconception when he supposed that all the large species of the latter genus were of equinoctial origin; for *C. Tmolus* of Fischer occurs in the vicinity of Orenburgh in Asia, under the 50th degree of north latitude †. Of the magnificent *Dynastidæ*, termed by Mr Kirby the " giants and princes of the insect race," the metropolis is strictly tropical, although a kind of advanced picquet is observable in *Oryctes nasicornis*, common in the south of Sweden. The reason why the last named insect, and several others which occur in Scandinavia, are unknown in Britain, may be inferred from some of our preceding observations,—in a torpid state, or under the form of larvæ, they are capable of enduring the rigour of a Swedish winter, but when vivified by the returning spring, the cool and variable summer of our " Sea-girt Isle" would prove insufficient for the full development of their vital functions.

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The genus *Meloe* seems almost peculiar to Europe, and Britain, which possesses nine species, has been regarded as one of its most characteristic countries. The Entomological characters of the southern shores of Europe strongly exhibit their geographical approach to the African Continent. The *Ateuchus sacer* (the renowned species sculptured of old by the Egyptians on their sacred monuments), and various species of *Scaurus* and *Akis*, may be regarded in the southern countries of Europe, as the *avant couriers* among the Coleopterous tribes of those more exclusively African forms which have their centre of dominion in the burning deserts. Along the Mediterranean shores, the entomological traveller may study the habits of many curious insects of the genera *Onitis*, *Cebrio*, *Pimelia*, *Brachycerus*, *Brentus*, and *Scarites*, and may also enrich his collection by the capture of many beautiful butterflies, and other lepidopterous insects, which are more truly characteristic of northern Africa. Spain especially, exhibits many features of African zoology. We shall not here talk of the cameleons, the scorpions, and other species belonging to the separate classes of reptiles and arachnides,—but the European entomologist will there discover for the first time several species of the genera *Erodius*, *Lepidium*, *Brachinus* and *Pimelia*. But it is only after crossing the Mediterranean, and traversing the African shores, whether north of the Atlas, or eastward towards the coasts of the Red Sea, that our eyes are delighted with the hitherto unknown forms of *Anthia*, *Graphipterus*, *Siagona*, and numerous other species unknown to the colder and moister shores of Europe.

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* *Introd. to Ent.* vol. iv. p. 490.

† *Entomographia Russica*, tab. 13. fig. 1.

The Coleopterous insects of Europe in general, according to M. Latreille, bear a strong affinity to those of Western Asia and Northern Africa. These traits of resemblance become more obvious, when, the qualities of the soil and the temperature being analogous, we approach towards the northern tropics. It is under the 44° N. Lat. that we begin to perceive certain species of carnivorous coleoptera, of the Lamellicornes, of the Heteromerous section, and of the Curculionidæ, characteristic of the warmer regions of the earth. There also may be observed species of a larger size, and of an aspect more imposing than characterise their congeners of the North. The dominion of the *Carabi*, properly so called, so notable over all the northern and temperate countries of Europe, and more western regions of Asia, ceases towards the 35th degree of North Latitude. These predaceous insects are succeeded by the genera *Anthia* and *Graphipterus*. Viewed in relation to entomological characters, Europe may be said to extend further eastward than it does in accordance with our actual political divisions, as the insects of the Levant *and even* of Persia exhibit a very European aspect. Austria and Hungary, from their central situation and other local circumstances, are numerically richer in species than the western countries of Europe. These latter, however, possess, in consequence probably of their littoral position and the influence of the oceanic waters, several peculiar species, which, though unknown in the east, nevertheless extend their localities in a lengthened line from north to south. However gorgeous may be the productions of tropical regions, the European continent presents to the entomologist a rich and varied assemblage both of carnivorous and herbivorous coleoptera. Many of these it possesses in common with other countries, while of some it has to boast of a more exclusive possession. The great tribe of the Carnivora, and especially the Carabi or larger predaceous beetles—the *Staphylinidæ* or Brachelytrous kinds—the *Clavicornes*—the genera *Aphodius*, *Meloe*, *Callidium*, *Leptura*, *Chrysomela*, *Lixus*, &c. are there proportionally more numerous than in any other quarter of the world. LATREILLE has observed that the herbivorous Coleoptera seem to prevail in South America. Many species of the northern countries of the New World greatly resemble those of the northern and temperate parts of Europe, while others are identical. Of these some may be regarded as naturally distributed alike over Scandinavia, Greenland, and the adjacent islands, and North America,—while the greater proportion, which are xylophagous or timber-eating insects, have very probably been transported by artificial means, that is, in cargoes of wood, and in the timbers of our vessels. Notwithstanding many examples which might be adduced to illustrate a certain agreement which exists between the species of Europe and North America, the more general as well as precise truth is, that the entomology of North America is connected by a stronger affinity with that of the southern division of the New World, than with that of our own continent and islands. We cannot, for instance, exhibit a single example of that division of *Cetonia* of which the thorax presents a posterior lobe, nor of *Galerita*, *Tetraonyx*, or *Parandra*, genera which are distributed throughout the whole of America. One strong feature of conformity has indeed been observed, that North America and Europe both possess many pores of the intestinal canal into the general cavity of the body, where, being oxygenated by the air-vessels, it performs the nutritive functions of blood. These proceedings, as usual, are attributed to a *vis formatrix*—a term of most convenient application where the mysterious workings of Nature are but dimly seen, or vaguely understood. But, whatever may be the mode or principle of development, we know that insects exist in the four following states—the *egg*, the *larva*, the *pupa*, and the *imago*, or perfect condition.

The first stage of *life*, properly so called, is that of larva, in which existence is usually more prolonged than in any other, and in which it does nothing but eat voraciously, and increase rapidly, with intervals of repose, occasioned by repletion. In this state, it is entirely sterile. In the course of, and towards the termination of the larva state, that peculiar internal secretion, the caul, epiploon, or greasy matter formerly mentioned, is observed to increase, and the insect then assumes the pupa state, which is usually one of inaction and apparent torpidity. Ere long, the skin of the pupa bursts asunder, or the wings and members become sufficiently developed for active exercise, and the insect assumes the perfect state, as exemplified in bees, beetles, and butterflies, all of which proceed from a worm-like larva. In this condition, they are usually less voracious, their principal object and occupation being the preservation or continuance of their kind.

All insects, however, do not pass through these transformations. Most of the apterous kinds issue from the egg in a form very similar to that which they maintain throughout their after lives; and even those that are subject to such signal changes, differ considerably in the nature and degree of metamorphosis to which they are subjected. Many of the winged kinds experience no other change than the reception of the organs of flight, and are therefore said to undergo a *demi-metamorphosis*. Their larvæ resemble the perfect insect, with the exception of the want of wings. Their pupæ merely differ from the larvæ, by exhibiting the rudiments of those organs, the eventual development of which produces the completion of the perfect insect. Such are the grasshopper and locust tribes, in which the pupæ continue to exercise their locomotive powers, and ordinary vital functions. Those insects which undergo a *complete metamorphosis* are changed from larvæ into motionless and inert pupæ, and this mode of transformation presents different gradations. The pupæ, or nymphs, as they are often called, of the Coleoptera, and several other orders, exhibit their external members in close approximation to the body, but *free*, and uncovered by any general membrane. But among the Lepidoptera, such as butterflies and moths, a somewhat elastic, but firm, and sufficiently solid skin or integument, is moulded over the entire body and its various members, of which the form and outline are distinctly impressed upon its surface. These were called *pupæ obtectæ* by Linnæus. Dipterous flies, again, are covered in their pupa state by small simple cases or egg-like shells, through which the form or proportions of the parts are in no way discernible. These were termed *pupæ coarctatæ* by the great Swedish naturalist.

The *geographical distribution* of insects in general, is a subject of too difficult and complex a nature to admit of being worthily treated in this introduction. We shall merely notice a few insulated facts. It does not appear that the climates of insects, or those peculiarities of temperature, and other physical attributes, under which particular groups or species appear to predominate, have been as yet studied in connection with our imperfect knowledge of isothermal lines. Mr KIRBY has stated, that in Greenland every order of insect has its representative, except Orthoptera and Hemiptera; but in Melville Island, besides these deficiencies, neither coleopterous nor neuropterous species exist, or at least were observable; and even the mosquito, that shrill tyrant of the Lapland plains, appeared to have ceased from troubling along those hyperborean shores. OTHO FABRICIUS resided six years in Greenland, and, during that period, he collected only sixty-three species of the insect class, properly so called. In the still higher latitudes of Winter Harbour, where Sir EDWARD PARRY sojourned, only six species were collected from the beginning of September till the August following. The most northern locality of any insect yet known, is that of the *Aphis borealis*, taken in latitude 82° 26′ 44″, about 100 miles from the nearest land *.

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* This species was found in the boat during the last day of Sir E. PARRY's attempt to reach the North Pole over the ice. There was no

It is probable, however, that the geographical distribution of many northern species is still unknown. It was formerly supposed that in Iceland there was none, and that even in Norway there were very few, and their absence from these countries was attributed to excess of cold. This opinion, however, was contradicted by **Horrebow**, so far as Iceland was concerned; and **Olafsen** and **Povalsen**, during their sojourn there, collected 200 different species in one small valley. It must indeed be borne in mind, that insects can escape the extreme of cold, not only, as Mr **Macleay** observes, by passing certain periods in the *pupa* or torpid state, but also by being, while in that condition, usually buried in the earth, where they are greatly protected from the rigours of the winter season. "What they chiefly require, is the presence of heat during some period of their existence: and the greater, within certain limits, is the heat, the more active will be their vital principle. On the American continent, the extremes of heat and cold in the course of the year are, as is well known, incomparably greater than in places of the same latitude in Europe. We may therefore readily conceive how particular families of insects will inhabit a wider range of latitude in the former country than in the latter. We also see how insects may swarm in the very coldest climates, such as Lapland and Spitzbergen, where the short summer can boast of extraordinary rises in the thermometer; because the energy of the vital principle in such animal is, within certain limits, proportionate to the degree of warmth to which they may be subjected, and escapes in a manner the severe action of cold *." It is on these principles that Mr **Macleay** accounts for what certainly at first seems an extraordinary circumstance in the geography of insects; namely, that their tropical structure extends much farther north in America than in Europe—that is, in a manner directly the reverse of that which has been noticed by botanists to occur in the vegetable kingdom. For example, the *Chamærops humilis*, a species of palm, occurs along the southern shores of

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vestige of vegetation around the adventurous party, and we think it more than probable that the forlorn insect had been carried *nolens volens* from a somewhat more southern quarter.

* *Horæ Entomologicæ*, part i. p. 45.

France, in Lat. 44°; while, on the eastern coasts of North America, the hardiest of the family, *C. palmetto,* does not advance beyond the 34°; but if we examine *Copris carnifex, Cetonia nitida, Rutela* 6-*punctata,* and other coleopterous insects from the neighbourhood of New York, and compare them with species of the same families from Brazil, we shall find their difference of structure infinitely less than that which would result from a comparison of the entomological productions of the environs of Madrid with those of the banks of the Congo *.

A slight consideration of the subject suffices to shew that certain differences in the relative intensities of summer and of winter must exercise a strongly modifying power on the influence of mean annual temperature, even in countries where that temperature is one and the same. "Several fruits, as the olive and grape, as well as the different kinds of corn and other annuals, depend more on the heat of summer than of the whole year; while others, impatient of cold, and not requiring great heat, have their range more influenced by the temperature of winter. Now, it is almost an universal rule, that of two places whose mean temperature is the same, that nearest the sea, and more particularly a western sea, has a temperate summer, and a milder winter. Hence the inland situation is better adapted to the growth of corn and fruits, the maritime one to the preservation of tender plants. In Europe, the northern boundary of the vine and olive rises as we go eastward, though in so doing, we encounter a lower mean annual temperature. The *Arbutus Unedo, Sibthorpia europæa, Erica ciliaris,* &c. rise in a westerly direction †." Whatever vegetation requires the absence of extreme cold, rather than the presence of extreme heat, will probably extend itself in a tropical form more towards the poles, on a dry continent, than on a moist or marshy one. Tropical plants, therefore, will thrive better in Thibet and other inland parts of northern Asia, than they would do if transported to positions of the same latitude in America; for in the latter country the extremes of heat and cold are too distant from each other. Thus, the vegetation of Canada does not correspond either in its general character, or its amount of species, with that of the corresponding latitudes of France *.

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ORDER—COLEOPTERA.

SECTION—ADEPHAGA*.

THE first primary division of the Coleopterous Order, contains a numerous and varied assemblage, all of which, however, agree in being, as the name imports, of a voracious disposition. Each maxilla is furnished with two palpi, so that there are *six* in all, including those of the labium.

In the larva state these insects are elongated, cylindrical, composed of 12 rings, exclusive of the head, which is large, of a scaly texture, and provided with two strong mandibles, curved at their extremities. The mouth is also furnished with a pair of maxillæ, divided into two branches, one of which is formed by a palpus. The languette bears two palpi, which are shorter than those of the maxillæ. The head is moreover provided with a pair of short conical antennæ, and in general six small simple eyes on each side. The first segment of the body is covered by a scaly plate or lamina; the others are soft. The first three segments are each furnished with a pair of feet, of which the extremity is curved forwards.

Of course many modifications occur in the form and aspect of adephagous larvæ. For example, those of the *Cicindelæ* have the upper portion of the head hollowed out in the centre, while the inferior portion is bulged. Two of the eyes on each side are much larger than the others; and the upper portion of the first segment of the body is also large, and shaped like a semicircular shield. The eighth segment bears two small hooked processes on its upper surface. Among the generality, however, of the adephagous larvæ, the head is weaker, and more regular, and the eyes are of equal size. The shield is square, and does not project over the sides; the eighth segment wants the processes; but the terminal segment is furnished with two conical appendices, besides a membranous tube formed by the prolongation of the anal portion of the body. These appendices are toothed and horny in the larvæ of *Calosoma* and *Carabus*. In *Harpalus* and *Licinus* they are more elongated, fleshy, and articulated. In these and other genera, the form of the mandibles in the larvæ approaches that of the same species in the perfect state.

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* So named from *ἀδηφάγος, voracious*. This section corresponds to the first family of the *Coleoptera pentamera* of Latreille, named *carnassiers* or *carnivora* in the "Regne Animal" of Cuvier, t. iv. p. 355.

The adephagous Coleoptera have always a first stomach, which is short and fleshy; a second, which is more elongated, and shaggy on the surface, on account of the numerous small vessels with which it is garnished; and a short and slender intestine. The hepatic vessels, four in number, are inserted near the pylorus.

SUBSECTION I.—GEODEPHAGA.

The genera of this subdivision of the Order dwell and take their food upon the surface of the earth. They are hence known under the name of Ground Beetles. The feet of these *terrestrial* species are formed for rapid motion, and the two posterior pair are inserted at equal distances. The mandibles are obvious and uncovered: the terminal portion of the maxillæ is straight inferiorly, and curved only at its extremity. The body is generally oblong, and the eyes are projecting. The tracheæ are tubular or elastic, and the intestine is terminated by an expanded cloaca, provided with two small sacs, which produce an acrid humour *.

FAMILY—CICINDELIDÆ.

This family corresponds with the genus *Cicindela* of Linnæus. Its genera are distinguished by a hook or nail, which is articulated by its base to the tip of the maxillæ. All the species have a strong head, with large eyes, projecting toothed mandibles, and a short languette concealed behind the mentum. The labial palpi are composed of four distinct articulations, and, in common with the maxillary palpi, are generally shaggy, or somewhat clothed. The greater proportion of the species are exotic.

GENUS—CICINDÉLA, *Linn.*—TIGER BEETLE. The name is employed by Pliny as synonymous with *Lampyris*, to designate a kind of luminous insect, accustomed to frequent corn-fields. *Plin.* xviii. c. 26.—Antennæ nearly filiform, the basal joint robust, inserted into the anterior margin of the eye: external maxillary palpi 4-jointed, the 2d joint as long as the two terminal ones; internal palpi consisting of two joints of equal length: labial palpi with the penultimate joint long, slightly thickened and pilose, the three others short and naked: mandibles with four long teeth, that next the base cleft (page 16, central fig.): thorax narrower than the head; eyes large and prominent: anterior tibiæ not notched; three basal joints of the anterior tarsi in the male very slightly dilated and lengthened.—*Curtis, British Entomology*, i. 1.

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* *Règne Animal*, iv. 358.

The name by which our present genus is distinguished, appears to have been applied by ancient writers to various destructive insects. In modern times, it was originally bestowed by M. Geoffroy on the species now classed under the genera *Malachius* and *Telephorus*, and was afterwards transferred by the great Swedish naturalist to the insects above defined. Their larvæ inhabit the earth, in which they form cylindrical holes, the entrance to which, while the occupant lies in ambuscade, is closed by the upper portion of its head. They are exceedingly voracious, and seize with their maxillæ whatever insect prey approaches within their grasp. Their bodies are long, cylindrical, whitish, and furnished with six brown scaly feet. When approached by human footsteps, or otherwise threatened by danger, they rapidly descend into their subterranean retreats. When two of these larvæ happen to form their retreat in the immediate neighbourhood of each other, the stronger devours the weaker, with a view to obviate any interference with his own pursuits. They seal up the entrance to their dwellings when about to change their skins, or assume the state of nymph. The perfect insects are extremely beautiful—of light and active forms—exceedingly swift in their motions—and adorned by brilliant metallic colours. The prevailing hues are different shades of golden green, spotted with white or pale yellow. They frequent dry and sandy soils, where they seem to enjoy the prevalence of bright sunshine. The species are extensively distributed over all the regions of the earth. The precedence is generally assigned to the *Cicindelæ* in systematic arrangements, from the same motives which have led naturalists to place the Feline and Accipitrine tribes at the head of their respective classes. The organs of locomotion, and those more immediately subservient to the preservation and nutrition of the individual, are very fully developed, and present, in the most perfect form, all the attributes which distinguish the entomophagous Coleoptera. They were named by Linnæus the Tigers of the insect tribes. "Though decorated with brilliant colours, they prey upon the whole insect race: their formidable jaws, which cross each other, are armed with fearful fangs, showing to what uses they are applicable; and the extreme velocity with which they can either run or fly, renders hopeless any attempt to elude their pursuit. Their larvæ are also equally tremendous with the imago, having six eyes, three on each side, seated on a lateral elevation of the head, which look like those of spiders, and, besides their threatening jaws, armed with a strong internal tooth, being furnished with a pair of spines resembling somewhat the sting of a scorpion, which stand erect upon the back of the abdomen, and give them a most ferocious aspect *." This last apparatus, according to Clairville, serves the purpose of an anchor, in retaining these larvæ at any desired height in their sandy cells.

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* *Introduction to Entomology*, vol. ii. p. 263.

C. campéstris.—Green, with five whitish spots on the margin of each elytron, and another in the centre. Length 5½–7: breadth 2¼–3 lines[*] **—*Linn. Don.* i. pl. 12.**

Head green, excavated between the eyes, and slightly striated; upper lip and base of the mandibles yellowish-white; palpi bronzed-black, the labial pair often greenish; four basal joints of the antennæ bright copper, the remainder obscure: thorax with a transverse impression before and another behind, united by a longitudinal line in the centre; the upper surface green, finely granulated, the sides beneath brilliant coppery-red: scutellum cupreous: elytra much wider than the thorax, rather dull green, finely shagreened, having six yellowish-white spots on each, one on the shoulder, three on the outer margin, of which the central one is more or less crescent-shaped, a transverse one at the apex, and another of a rounded form, edged with fuscous, on the disk a little behind the middle: body beneath shining greenish-blue, with white hairs; legs coppery-red, glossed with green, the tarsi usually of the latter colour.

The spots on the elytra vary in shape and disposition, and some of them are occasionally obliterated. The female has two fuscous spots towards the base of the elytra, and is distinguished, independently of the slender tarsi, by having the abdomen divided into six segments,—that of the opposite sex consisting of seven, with the penultimate one more or less emarginate.

This beautiful insect has not been observed in the immediate vicinity of Edinburgh; but it occurs on the Pentland Hills, and near Rosslyn, chiefly during the months of May and June.

It frequents dry sandy places exposed to the sun, most commonly in the neighbourhood of heaths, and is distributed more or less abundantly over the Lowlands, and most parts of the Highlands of Scotland, as far as Inverness-shire, extending probably to the northern extremity of the island. It is an inhabitant of most European countries, ranging from the shores of the Mediterranean to Siberia. This is the most abundant of the British species, and the only one which we have it in our power to record as Scottish. The supposed species *C. Maroccana*, Fab., which occurs in Spain, and along the coast of Barbary, is now regarded as one of its varieties.

The ensuing families of the first subsection all pertain to the tribe *Carabiques* of Latreille, which is itself nearly identical with the great genus *Carabus* of Linnæus, prior to its partition by recent authors. We therefore consider this as the proper place in which to introduce a few general observations, which may be regarded as applying to the remainder of the adephagous tribes.

The maxillæ are simply terminated by a point or hook, which is not articulated as in the preceding genus. The head does not exceed the breadth of the thorax, and is more frequently somewhat narrower. The mandibles, with few exceptions, are but sparingly toothed. The languette is usually projecting, and the labial palpi exhibit only three free articulations*. Many species are apterous, that is, have no membranous wings beneath the elytra. Their odour is often fetid, and their bodies exude an acrid fluid. The habits and economy both of the larvæ and perfect insects are exceedingly various. Some conceal themselves under the earth, others beneath stones, or the bark of trees. They are active in their movements, and are very generally distributed, being, however, more characteristic of temperate than equatorial regions. M. Geoffroy bestowed the generic name of *Buprestis* upon carabideous insects, on account of the injury which he supposed them capable of inflicting on cattle; and it is possible that the caustic humour with which many of them are imbued, might be productive of bad effects, in the event of their being swallowed along with better and more usual pasture. To whatever species this evil tendency was attributed, the ancients appear to have regarded its other characteristics with admiration; for the physicians of olden times held it as equal in virtue to Cantharides. Linnæus, however, transferred the name of *Buprestis* to the genus *Cucujus* of Geoffroy, although none of the latter genus in any way corresponded to the Βουπρηστις of the Greeks. The change proposed by the great reformer has been universally adopted, and the word *Carabus* is now most familiar to the ear of the entomologist.

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[*] The figures immediately succeeding the specific character, refer to the length of the species; when others are added after a colon, they indicate its greatest breadth. The measurement is given in lines, twelve of which form an inch.

As the larvæ of the *Carabici* dwell in subterranean retreats, a knowledge of their habits and history is difficult to acquire. The body is of an elongated form: the legs are six in number, and of a scaly texture; and the maxillæ are strong and pincer-like. With these they seize upon the larvæ of other insects, which constitute their favourite food. They are extremely voracious.

In relation to the economical purposes of the human race, the tribes now under consideration are of no great utility. It is mentioned, however, by the younger Geoffroy, that, while he was collecting insects on the coast of Senegal, a Negro brought him a jar containing many thousand specimens of a small carabideous species, which had evidently been previously collected by design. On inquiry, he found that they were used for making soap, some of which, of a black colour, he afterwards examined, and found it to possess all the qualities of the European article. Olivier asks whether we could not extract from our indigenous species an alkaline matter subservient to the same end†.

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* In the genus *Cicindela*, the radical joint is free, on which account the palpi are said to consist of four articulations; but among the *Carabici* it is adherent, and forming only a support to the others, is not itself regarded as an articulation.

† *Hist. des Insectes*, vol. iii, No. 35. p. 11.

and their growth is almost instantaneous. It has been remarked, that the larvæ which feed on leaves such as those of *Crioceris*, *Haltica*, and *Chrysomela*, remain but a brief period in the larva state, while the subterranean and root-devouring species, on the contrary, not unfrequently continue for two or three years in their dark abodes. Attentive observation has also ascertained, that those coleoptera which pass the winter in the egg state are the shortest lived in the form of larvæ;—they are hatched, nourished, developed, reproduce, and perish, all in the course of the summer first ensuing,—while such as pass the winter in the larva state, or that of nymph, are the longest lived in both of those conditions. It is chiefly in the form of larva that the coleoptera produce such injury to agriculture and other branches of rural industry. The ravages of species belonging to the genera *Bruchus*, *Curculio*, *Calandra*, *Melolontha*, *Crioceris*, *Haltica*, *Anthrenus*, *Dermestes*, and numerous others, are unfortunately better known than any counteracting remedies of easy application.

The larvæ of the coleopterous tribes usually change their skins three times, and many of those which live in the earth construct a kind of cocoon in which they undergo their transformations. These are of the kind formerly mentioned under the name of *complete* metamorphosis.

In drawing up the specific descriptions which necessarily compose the greater portion of the present volume, we have, in the first place, consulted *nature*, that vital and essential source from which all our knowledge flows. We have ourselves either collected or attentively examined the whole of the species described, and we have endeavoured to record their characters with as much clearness and accuracy as our own powers of discrimination and expression admitted. While we have thus never failed to keep the specimens themselves in view, we have also felt the advantage of making our descriptions accord with those of preceding writers, whenever the latter were ascertained by careful comparison to be consistent with nature. The foreign authors from whom we have chiefly derived assistance are GYLLENHAL and DE JEAN. The *Insecta Suecica* of the former is one of the few works on the coleoptera which has not been left in an uncompleted state; and the great accuracy of the descriptions, expressed in language remarkable alike for precision and perspicuity, renders it a publication of the very highest value. The *Species Général des Coléoptères* of Count DE JEAN we have also found of essential service, and although it applies as yet to but a small segment of the great circle of coleopterous insects, it will undoubtedly form, when completed, the most indispensable guide to the study and arrangement of that numerous and diversified order. Among the British authors, we stand most indebted to the elaborate and excellent works of Messrs STEPHENS and CURTIS, which have formed a new era in the history of our native Entomology, and raised that department of science in Britain at least to an equality with its condition on the continent. The "Systematic Catalogue of British Insects" published by the former of these gentlemen, though only the forerunner and expositor of an ample historical and descriptive work on the same subject now already far advanced in its publication, was the first to exhibit any thing like a proper *census* of our actual species; while his "Illustrations of British Entomology," pleasingly illustrated in a pictorial point of view, and containing very admirable descriptions, will not fail of being classed with the most successful efforts in that line. In relation to Mr CURTIS's "British Entomology," it may be safely said, that for elegance of design and accuracy of execution, combined with the most beautiful and exquisitely finished mode of colouring, it is a matter of doubt whether any rival to its plates can be found within the entire range of entomological publications. Their examination must prove delightful not alone to the mere entomologist, but to every eye accustomed to receive pleasure from the tasteful representation of nature.

The collecting of coleopterous insects is a very simple matter to those who are zealous in the cause. By far the best method is for the collector to provide himself with a few stout phials half filled with whisky, or any other ardent spirit which he may happen to prefer. When the insects are caught, which they can only be in any considerable number or variety by a sedulous search under stones, and in the different localiupon the soft-bodied and defenceless caterpillars, and on all other insects weaker than themselves, but they even seize upon and devour their own species. They usually avoid strong light, are partial to a certain degree of moisture, and conceal themselves during the heat of the day beneath stones, among mossy herbage, in garden rubbish, or under the stems or within the hollows of fallen trees. We have noted the usual habits of each of the species, in the descriptions which follow; and, in regard to their general distribution, we may observe, that their principal seat appears to be the north temperate zone, that they are extremely rare in the warmer regions of the earth, and probably disappear altogether within the tropics. Their larvæ and metamorphoses are but slightly known. Many of the perfect insects exhale a penetrating and fetid odour, and, when touched, exude a dark-coloured caustic humour.

A. *Elytra with three rows of oblong tubercles on each.*

C. catenulátus.—Oblong-ovate, black, the margins of the thorax and of the elytra violaceous; elytra with interrupted crenated striæ, and three rows of impressed dots, the spaces between the dots slightly elevated. 11–12: 4–5½.—*Fab.* *Car. intricatus, Marsh.*

Head black, frequently tinged with violet, striated over the eyes, and having two longitudinal impressions between the antennæ; the four basal joints of the latter shining black, the rest brownish and pubescent: thorax considerably wider than long, rugosely punctate, of a deep violet colour, blackish in the middle, having a faint longitudinal line, and elevated margins, which are produced behind into a rather obtuse angle: elytra oblong-ovate, black, with a violet or purplish margin; rather convex above, with closely placed elevated lines, often interrupted and crenated, particularly towards the outer margin and apex; the 3d, 7th, and 11th, impressed with dots, the spaces between which are slightly elevated, forming a catenulated line, often however very indistinct: body beneath, and legs, shining black.

The most common species of the genus, not only in this neighbourhood, but throughout the southern district of Scotland. It is likewise frequent in England and Ireland, and most other parts of Europe. In Germany and Italy it is rather scarce, and is there found only in mountainous situations. In Scotland, though common on the plains, it also occurs in the hilly districts, at a considerable elevation[*].

C. monílis.—Oblong ovate, thorax coppery, elytra brassy-green or violaceous, with three series of oblong tubercles, and three equal elevated lines between them. 11–13: 4–5½.—*Fab.*—*Car. catenulatus, Linn.*—*Oliv.* iii. pl. 3. f. 29.—*Marsh.*

Colour very variable, sometimes metallic green or cupreous, at other times deep blue or violaceous, and occasionally almost black: head marked as in the preceding species; four basal joints of the antennæ black, slightly bronzed, the remainder brownish and pubescent: thorax broader than long, finely punctured and wrinkled, the longitudinal line rather faint, and the lateral margins somewhat elevated, and produced behind into an obtuse angle: scutellum blackish: elytra rather convex, with three rows of oblong tubercles on each, and three lines, nearly equally elevated, between the rows; the suture and lateral margins generally black: under side of the body and legs shining black.

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[*] We possess an example of a *Carabus* taken by H. C. Watson, Esq. among the mountains in the west of Aberdeenshire, which bears some resemblance to the above, but presents at the same time so many points of difference, that it ought perhaps to be described as a new species. *C. catenulatus*, however, assumes so many variations in colour, and even in form, that we prefer to consider it in the mean time as a variety of that insect. It may be identical with some of the species described by Sturm, and other German entomologists, which Dejean regards as varieties of *C. catenulatus*.—Upper surface entirely black, the elytra slightly brownish; body not so much arched lengthwise as in ordinary specimens of *C. catenulatus*: palpi with the terminal joint considerably dilated and triangular: thorax with wide reflexed margins, the disk depressed, rugosely punctured, the central line faintly marked: abdomen rather depressed towards the base, marked nearly as in *C. catenulatus*, the 3 catenulated lines scarcely perceptible: reflexed margin of the elytra and sides of the thorax slightly tinged with violet: abdomen and legs deep shining black. 10½: 3¾.

Rather scarce: it has been taken near Coates, immediately to the west of the New Town. It appears to be nowhere frequent in Scotland, although plentiful in many parts of England. France seems to be its principal locality, where there occurs a common variety, in which there is only a single elevated line between the series of tubercles, the others having become obsolete. This variety, which has likewise been found in England, constitutes the *Car. consitus* of Panzer, and the *Bupreste galonné* of Geoffroy *.

C. arvénsis.—Ovate, greenish copper or brassy above, elytra with three series of oblong tubercles, and three crenulated lines between them, the central line rather elevated. 8–9½ : 3½–3¾.—*Fab. Ent. Trans.* i. pl. 7. *Middle Fig.*

Head cupreous, with shallow punctures and an impression on each side anteriorly; palpi and four basal joints of the antennæ shining black: thorax covered with shallow punctures and confluent wrinkles, coppery, with greenish or golden reflections, particularly on the sides, which are slightly elevated; having a faint line down the middle, and an indistinct fovea near the hinder angles; the latter slightly prominent and rounded: elytra oblong-ovate, convex, widest in the middle, cupreous, the margins often greenish or golden, with three rows of oblong tubercles on each, between each of which are three crenulated lines, the central one somewhat elevated: under side of the body and legs shining black.

The only locality in the neighbourhood for this species, is the Pentland Hills, where it occurs but sparingly in the months of May, June, and July. It has been taken by Dr Leach in the Isle of Arran, and is not unfrequent on heaths in the north of England, and south of Scotland in the vicinity of Jedburgh.

C. cancellátus.—Oblong, metallic green or brassy, elytra with three rows of oblong tubercles, and a single smooth elevated line between them. 9–10½ : 3½–4½. *Fab.*—*Car. granulatus, Linn. Don.* vii. pl. 222. f. 3. *Car. morbillosus, Leach. Sam. Comp.* pl. 3. f. 7.

Somewhat depressed, generally of a brassy green above, sometimes nearly black; head punctate, with the usual impressions; mouth, palpi, and four basal joints of the antennæ, shining black: thorax punctured and wrinkled, very little narrowed behind, the posterior angles slightly prominent and obtuse, the central line faint, the foveæ near the angles deeply impressed: elytra not much wider than the thorax in the males, considerably wider in the females, dilated behind the middle; with three rows of long tubercles on each, and a smooth elevated line between the rows, that next the suture abbreviated behind; the interstices granulated, and the outer margin with a row of small raised points: underside of the body and legs shining black, the sides of the breast green bronze.

Not unfrequent in rotten wood, and beneath stones on wall-tops, &c. Cramond. Rosslyn. Near Craigleith Quarry. Collinton, &c.

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* Dejean, *Species général des Coléoptères*, ii. 75.

B. *Elytra with three rows of excavated dots.*

C. horténsis.—Ovate, thorax black, margined with purple, elytra brassy-brown, with three rows of excavated dots. 10–12: 4–5½.—*Fab. Marsh. Car. nemoralis, Illig. Leach. Car. gemmatus, Don.* viii. pl. 222. f. 2.

Broader in proportion to its length than the other species: head and thorax black, rather rugosely punctate; the former with a large impression on each side, and somewhat rugged between the eyes; the latter nearly twice the breadth of the head, subquadrate, glossed with purple on the sides, the hinder angles considerably produced and subacuminated, having a faint dorsal line, and a large impression on each side behind: elytra convex, generally brassy-brown with a purple margin, sometimes greenish, with the margin of the same colour, thickly covered with longitudinal wrinkles, which run together and are often interrupted, making the surface appear granulated; each elytron having three rows of remote excavated dots, the spaces between the dots sometimes slightly elevated, forming an inconspicuous catenulated line: body beneath, and legs shining black.

Nearly as common as *C. catenulatus*, occurring in gardens, on pathways, &c. during spring and summer, but not partaking with that species in the height of its occasional localities.

C. *Elytra finely granulated, without striæ.*

C. violáceus.—Elongate, black, the margins of the thorax and of the elytra violaceous, elytra dull black, granulated. 10–12: 4–4¾.—*Linn. Marsh. Don.* vii. pl. 222. f. 1.

Considerably elongate; palpi, four basal joints of the antennæ, and head, shining black; the latter faintly wrinkled behind, and having two longitudinal impressions between the antennæ: thorax rather narrow in the male, with the margins much elevated, nearly quadrate in the female, with the margins very slightly elevated; the surface thickly punctured, rather ruggedly behind, the margin violaceous, the hinder angles deflexed and obtuse; the central line and foveæ near the angles shallow: elytra oblong-ovate, convex, slightly acuminated at the apex, the surface granulated and of a dull black colour, the margin golden violet or purple: under side of the body and legs shining black.

Not so common in Scotland as further to the south, but found occasionally in woods and fields, and sometimes among rubbish, and in gardens in the city. It likewise occurs on the Pentland Hills, and among the Grampian Mountains, but does not appear to attain to any considerable height on the latter range.

C. glabrátus.—Oblong, entirely black, the elytra very finely granulated and shining. 11–12: 4½–5.—*Fab. Oliv. Don.* xv. pl. 506.

Shining black, tinged with bluish in certain lights; head striated over the eyes, with two foveolæ between the antennæ: thorax subquadrate, very wide in the female, entirely black, punctured confluently, with a central line, and obtuse prominent angles behind: elytra as wide a little behind the base as in the middle, very convex, shining black, with the margin of the same colour; covered with very minute longitudinal granulations, and having a row of small points along the outer margin: under side of the body and legs shining black.

Inhabits the Pentland Hills, but is very scarce. It is not unfrequent in the mountainous districts of Scotland, where it was first taken many years ago by Professor Hooker, and afterwards by Dr Leach. We took it frequently among the Clova mountains, near Colonel Ogilvie's Shooting-Lodge, at the head of the South Esk, and on the hill-pastures at the heads of Loch Lee and Loch Callader, and we have seen specimens from Peebles-shire and Ben Lomond. Although characteristic of alpine localities, Dr Greville informs us, that he once took a specimen in the low grounds of Forfarshire, near Glammis Castle. This fine insect is generally found *travelling* at rather a rapid pace among the grass, or along the mountain pathways. We have never observed it stationary under stones, like its congeners *C. violaceus* and *catenulatus.* All our own specimens were captured during the first and second weeks of August. The elytra are softer and more flexile than among the allied species.

D. *Elytra furrowed.*

C. nítens.—Ovate, head and thorax golden-coppery, elytra brilliant green, margined with coppery-red, and having three black ribs on each. 7–7½ : 3–3¼.—*Linn. Don.* ix. pl. 313. *Car. aureus, De Geer.*

Head golden, tinged with green, punctured and slightly impressed on each side; palpi and lower joints of the antennæ black: thorax somewhat quadrate, the sides equally rounded and margined, the hinder angles not very prominent; moderately convex above, thickly punctate, with a central line, and a shallow foveola on each side at the base; the colour greenish-copper or golden: elytra with three strong ribs on each (sometimes interrupted or anastomosing), and the suture, of a blue-black colour, the interstices of a very brilliant green and transversely rugose; the external margin splendid coppery-red; under side of the body and legs shining black.

This, the most richly adorned of British Carabi, and one of the most beautiful of coleopterous insects, occurs sparingly among the Pentland Hills. It has been likewise captured in various parts of the country, in Lanarkshire, Argyllshire, Perthshire, Forfarshire, &c., but is always regarded as a valuable acquisition. The sexes do not present any very marked difference in the form of the tarsi or thorax.

The only other species of Carabus found in Scotland, is *C. clathratus.* It does not occur in the Edinburgh district, but was taken pretty plentifully some years ago by Mr Wilson in the Island of Colonsay. It has also been found in Caithness by Mr Macleay.

GENUS—HELÓBIA, *Leach.* From ἑλλόβια, a name anciently conferred on certain animals, owing to some peculiarity in the structure of the ears.—Antennæ filiform, 1st joint ovate, robust, 2d shortest, 3d slightly clavate, the remainder cylindrical, of nearly equal length: external palpi with the 1st joint minute, 2d long and robust, 3d short, clavate, 4th longer than the 3d, and clavate-truncate; internal with two joints of equal length; labial with the basal joint minute, 2d long, pilose, 3d longest, truncate: labium or under lip quadrate, with a tooth in the centre: mandibles curved, acute, denticulated at the base: thorax short, transverse, the base nearly straight: body depressed: males with the anterior tarsi dilated.—*Curtis, B. E.* iii. 103.

H. brevicóllis.—Black, elytra crenate-striate, antennæ, tibiæ, and tarsi, reddish-brown. 5–5¾ : 2¼–2¾.—*Steph. Nebria brevicollis. Fab. De Jean. Gyllen. Car. rugimarginatus, Marsh. Sturm's Deut. Faun.* v. pl. 67.

Head glossy black, with two shallow impressions between the eyes mouth, palpi, and antennæ, reddish-brown: thorax much wider than long, short, dilated before the middle, the lateral margins reflexed, the hinder angles acute, but not produced; the disk somewhat convex, smooth and shining, the sides ruggedly punctured all round, the front and base with a transverse impression, and a fovea on each side between the basal angles and the central line: elytra nearly twice the length of the head and thorax, rather depressed, black or brownish-black, deeply punctate-striate, with a short stria on each side of the scutellum, and four larger dots on the third from the suture, which, however, are often inconspicuous: under side of the body and thighs brownish-black, the tibiæ, tarsi, and trochanters, reddish-brown.

Common almost everywhere beneath stones, &c., and may be found during the greater part of the year. It is almost equally common in all parts of Europe.

H. Gyllenhálii.—Black, the apex of the antennæ and tarsi pitchy-red, elytra deeply striated, the striæ subpunctate. 4¼–4¾ : 2.—*Steph. Neb. Gyllenhali. Gyll. De Jean. Curtis, B. E.* iii. 103. var.

Smaller, of a deeper black, and usually less depressed than the preceding species; palpi and four basal joints of the antennæ black, the tips of the joint piceous: thorax shorter and narrower behind than in *H. brevicollis*, marked as in that species, but not so thickly punctured on the margins: elytra black, deeply striate, the striæ with a few punctures towards the base, and from two to four larger impressions on the sutural edge of the third; the external stria rendered somewhat flexuose by a series of impressed dots: body beneath, thighs, and tibiæ, black; tarsi, trochanters, and sometimes the tibiæ, reddish-brown.

First ascertained to be a native of Scotland by the late R. Rawlins, Esq., who met with it near Edinburgh. It is by no means a scarce species in Scotland, occurring by the sides of rivers and on mountains. Banks of the Esk, near the new bridge in the line of the Railway, Water of Leith, &c. A variety occurs with red legs (figured by Mr Curtis, B. E. iii. 103), which appears to be very scarce in the south of Scotland, but we observed it in great abundance on the north side of the valley of Clova, and up the hill-sides from the Kirktown to Loch Brandy, as well as elsewhere among the Grampian range. In many of the specimens the palpi and basal joint of the antennæ were rufescent, and several seemed perfectly to correspond to the *Nebria nivalis* of Paykul and Gyllenhal, but we were unable to satisfy ourselves that they were specifically distinct from the others. We possess an individual from the summit of Ben Lawers (altitude 4015 feet), in which the palpi, two lowest joints of the antennæ, and legs, are red, and the elytra rufescent. The only other certainly determined British species, *H. Marshallana, Steph.*, has been captured lately on Ben Lomond, and was presented to us by Dr Greville.

Genus—LÉISTUS, *Froehlich.* Named probably from λειστὸς, adapted to live by prey.—Antennæ long, filiform, slender; 5th joint longest, 1st and 3d of equal length, 2d and 4th shortest: external palpi elongated, 2d joint long, rather stout, 3d and 4th shorter, the latter clavate and truncated obliquely; internal with the 1st joint clavate, 2d linear, bent; labial with the penultimate joint very long and slender, the terminal clavate and obliquely truncated: maxillæ or under jaws dilated at the base externally, and furnished with a row of strong spines (Pl. I. fig. 1): mandibles dilated in a semicircular form at the base (Pl. I. fig 2): thorax transversely ovate or heart-shaped, much dilated on the sides, aud contracted at the base: anterior tarsi of the males very slightly dilated.—*Curtis, B. E.* iv. 176.

L. fulvibárbis.—Bluish-black, mouth, antennæ, and legs, ferruginous-red. 3¼ : 1¼.—*De Jean. Steph. Curtis, B. E.* iv. 176.

Brownish-black, with a blue tint; head rounded, contracted behind into a short neck, and impressed on each side between the eyes; upper lip, mandibles, palpi, and antennæ, ferruginous-red; eyes prominent: thorax transverse, short, the sides rounded and narrowly margined, with a wide transverse impression before and behind, united by a line down the centre; the front and base closely punctured, the sides sparingly,—the disk smooth: elytra wider than the thorax, deeply punctate-striate, with a short stria on each side of the scutellum, and a few remote very indistinct dots on the sutural edge of the third stria: body beneath piceous; legs ferruginous-red.

Discovered near Edinburgh by the late R. Rawlins, Esq. It is found occasionally in various parts of the country, but nowhere in great plenty. Cramond, under the bark of trees. Woods near Dalkeith.

L. rufèscens.—Ferruginous, the head and apex of the abdomen blackish-brown. 3¼ : 1¼.—*Steph. Car. rufescens, Fab. Marsh. L. terminatus, De Jean.*

Oblong; head black, the mouth, palpi, and antennæ pale: thorax not so much contracted behind as in the preceding species, marked in a similar manner, but more convex, and sparingly punctured, the colour ferruginous: elytra widest behind the middle, rather convex, punctate-striate, the striæ rather faint towards the external margin, ferruginous; with the apex more or less suffused with black: abdomen dusky, legs pale.

Var. *b.* Elytra entirely ferruginous.

Not unfrequent in fir-woods at the roots and on the decayed stumps of trees, beneath the moss. Braid Wood. Fir-wood at the base of the Pentland Hills, near Dreghorn. It likewise occurs in other parts of the country, and on one occasion was observed in great profusion near Rae-hills, on some fir-trees which were partially stripped of their bark, attracted, probably, by the small insects entrapped in the resinous juice which had exuded from their stems. It has been taken at Stewart-field, near Dunkeld.

FAMILY—BRACHINIDÆ.

The genera of this family belong to that section of Latreille's Carabici, which he terms *Truncatipennes,* so named from one of their distinguishing characters, the truncation of the elytra, which appear as if they were cut somewhat square at their extremities, leaving a small portion of the abdomen exposed. * The languette is generally oval or square, and is rarely furnished on its sides with those salient divisions called paraglossa by Latreille.

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* The foreign genera, however, *Graphipterus* and *Anthia,* present rather a sinuation than a truncation of the extremities of the elytra.

The genus Brachinus, from which our present family derives its name, has, as far as yet known, no representative in Scotland. But as the southern parts of the kingdom produce five species, we are not without hope that some of these may be discovered on this side of the Tweed. It is, however, evidently a southern genus, for of the nineteen species of the first division of De Jean, only one, the *B. hispanus* of Kollar, is found in Europe. It was taken at the southern extremity of Spain by an Austrian naturalist, who happened to disembark in the Bay of Algesiras, in the course of his voyage to Brazil. Of the twenty-one species which constitute the second division of the genus, eight occur in Europe, and of these five are English. The character by which the generality of these insects are so remarkably distinguished, is, that the abdomen contains peculiar organs which secrete a caustic liquor of an extremely penetrating odour. When this is propelled by the insect, on any threatened danger, it produces a detonating sound and evaporates. M. Dumeril has remarked, that when this reservoir is opened by dissection, the liquid effervesces and evaporates instantaneously. Paper imbued with a blue vegetable dye is changed by its action, first into a reddish hue, and then into yellow. When the vesicle which contains it is placed upon the tongue and compressed, a peculiar and rather agreeable savour is felt in the mouth. A sharp pain, however, soon follows on the spot affected, where a yellow colour becomes perceptible, similar to that produced by a drop of nitric acid. Leon Dufour has made us acquainted with the apparatus employed in the production of this fluid.[*]

It is stated by Rowlander, that the Brachini are capable of producing eighteen or twenty discharges at a time. Mr Stephens has invariably found them ready to discharge their ammunition at all times, especially when roughly handled; and Mr Cooper informed him, that a specimen he met with at Cobham, in the spring, performed the operation no less than thirteen times in rapid succession.[†]

Besides the species subsequently described, no other members of the family have been detected in Scotland, except *Tarus basalis*, which has been recently taken by Mr Little in most of the mountains in Dumfries-shire, on Windlestraw Law in Selkirkshire, and in several other situations. It is figured by Mr Curtis.[‡]

GENUS—DRÝPTA, *Fabricius*. Named from δρυπτω, to tear with the claws.—Antennæ filiform, the basal joint as long as the head, 2d very short: external palpi with the basal joint short, 2d elongate, the two following somewhat conical, the apex of the terminal one obliquely truncate on the inner side; internal consisting of two joints of equal length; labial with the terminal joint obliquely truncate: mandibles long, narrow, without teeth: thorax long, cylindrical, nearly of the same breadth as the head: tarsi with the penultimate joint bifid; the anterior pair with the three first joints very slightly dilated in the males.—*Lat. Gen.* i. p. 196.

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[*] Mem. sur le Brachine tirailleur, *Ann. du Mus.* t. xvii. p. 70.

[†] Stephens's *Illustrations*, vol. i. p. 35.

[‡] *British Entomology*, vol. v. p. 235.

D. emargináta.—Blue, punctate and pubescent; the mouth, antennæ and legs rufous. 3¼–4 : 1½.—*Fab.* *Cicindela marginata, Oliv.* *Steph. Illus.* pl. 1, f. 2.

Upper surface bright blue, often tinged with green: head triangular, deeply punctate; the eyes blackish, and prominent; antennæ and appendages of the mouth reddish, the former with the apex of the first and middle of the second and third joints dusky: thorax slightly narrowed behind, with a faintly impressed dorsal line: elytra double the breadth of the thorax, rather widest at the apex, where they are truncate and slightly notched; deeply punctate striate, and clothed with yellowish pubescence, the interstices punctulated: body beneath greenish blue; legs rufous, tarsi sometimes obscure.

Said to have been taken, several years ago, beneath marine rejectamenta at Leith sands, on the authority of the Rev. J. W. Hope; but it has not recently been observed in this situation. It has likewise occurred in the south of England, but so seldom that it is still esteemed one of the rarer British insects.

GENUS—DRÓMIUS, *Bonelli.* Named from *δρομευς, a runner.*—Antennæ filiform, the basal joint elongate ovate, robust, 2d rather shortest, the rest nearly of equal length: external palpi with the terminal joint elongate ovate, truncate; the terminal joints of the internal and labial palpi ovate: mandibles short, broad, toothed at the base: head ovate, slightly produced behind: thorax more or less heart-shaped: elytra depressed, truncate at the apex; anterior tibiæ notched; tarsi with the penultimate joint not divided; claws furnished with small teeth.—*Curtis, B. E.* v. 231.

D. lineáris.—Elongate, head and thorax ferruginous, elytra paler, punctate-striate, the apex dusky, legs and antennæ pale. 2–2½ : ½–¾.—*De Jean.* *Car. linearis, Oliv.* pl. 14, f. 167. *a. b.* *Marsh.*

Body narrow and elongate; head ferruginous, generally darker than the thorax, striated between the eyes; mouth, palpi, and antennæ paler: thorax longer than broad, of the same breadth as the head in front, narrowed behind, slightly convex, shining rufo-ferruginous, with a faint central line and elevated margins: elytra rather widest behind, straw-colour, distinctly striated, the striæ punctured, the apex more or less dusky: body beneath ferruginous, the abdomen more obscure: legs pale yellow.

The most common species of the genus near Edinburgh; occurring beneath stones, among herbage at the roots of bushes, &c. Salisbury Craigs. Figget Whins.

D. ágilis.—Oblong, head and thorax ferruginous, the latter subquadrate; elytra dark-brown, striated, with a double series of impressed dots on each. 2¾–3 : 1–1¼.—*De Jean.* *Lebia agilis, Gyllen.*

Head rufo-ferruginous, with a very few faint striæ over each eye; mouth and antennæ rather pale: thorax nearly quadrate, narrowest behind, usually of a paler colour than the head, and having an impressed line along the middle, the reflexed margin rather broad: elytra dark-brown, obsoletely striated, with a row of faintly impressed points between the second and third, and another between the sixth and seventh striæ: body beneath ferruginous; legs testaceous.

Not common. Near Cramond House. This is a variable species, occurring at times with the head pitchy-black, and occasionally with a pale spot on the middle, or towards the base of the elytra.

D. quadrimaculátus.—Oblong, head black, thorax ferruginous, elytra substriated, blackish, with two pale spots on each. 2½ : 1.—*Car. 4-maculatus, Linn. Marsh. Lebia 4-mac. Leach. Gyllen.*

Head somewhat rounded, black, faintly striated, the striæ extending behind the eyes; mouth, palpi, and antennæ pale ferruginous: thorax dark rufous, somewhat quadrate with rounded angles, wrinkled across, and having a faint line along the centre: scutellum triangular, the colour of the thorax: elytra parallel, depressed, faintly striated, black or brown-black, with two yellowish-white spots on each, one before the middle, of an ovate form, the other, which is rounded anteriorly, occupying the apex: body beneath piceous; legs pale.

This pretty insect is not unfrequent under the bark, and in the crevices of the trunks of trees, where it usually passes the winter. In summer it is found likewise under stones. It appears to be distributed in considerable abundance over all Europe.

D. fasciátus.—Oblong, head black, thorax ferruginous, elytra pale anteriorly, fuscous behind with a pale spot on each. 1½–1¾ : ½–¾.—*De Jean. Car. fasciatus, Fab. Lebia fasciata, Gyllen.*

Head black, smooth and shining, with a small impression on each side between the antennæ, the latter as well as the palpi pale yellow: thorax brown ferruginous, the hinder angles nearly acute, paler, the central line rather deeply impressed: elytra smooth, the striæ nearly obliterated, the anterior part pale, the hinder brown with a pale spot on each side of the suture: under side of the body piceous; legs pale yellow.

Frequent under stones, among moss, and withered grass at the roots of hedges, &c. Salisbury Crags. At the roots of furze bushes, and under stones along the shores of the Firth of Forth.

D. fovéolus.—Brassy-black, elytra obsoletely striated, with two impressed dots on the disk of each. 1½ : ¾.—*Steph. Leb. foveola, Gyllen. Dro. punctatellus, De Jean.*

Rather short, entirely shining black, glossed with brassy above; head smooth, without striæ; palpi and antennæ black: thorax narrowed behind, the angles rather rounded, the central line pretty deeply impressed: elytra very obscurely striated, with two remote impressions near the third stria, the apex rather obliquely truncate: under side of the body and legs shining black, tarsi brownish.

Plentiful from May to July on dry elevated pastures where the soil is sandy, running about with much rapidity during the heat of the day among the short herbage. Arthur's Seat. Craiglockhart. Braid Hills.

GENUS—LÁMPRIAS, *Bonelli.*—Antennæ nearly filiform, basal joint cylindric, rather stout, 2d shortest, 3d somewhat longer than the first, the remainder equal, shorter than the 3d: external palpi with the 2d and 4th joints of equal length, the latter truncate; internal with the last joint considerably shorter than the first, and somewhat ovate; labial with the first joint short, 2d long and clavate, 3d longest, thickened in the middle, truncate at the tip: thorax transverse, produced in the middle behind: elytra wide, depressed, truncate at the apex: anterior tibiæ notched on the inside: three basal joints of the tarsi triangular, the penultimate slightly bilobed: claws with small teeth beneath.—*Curtis*, *B. E.* vi. 282.

L. chlorocéphalus.—Brilliant bluish-green, base of the antennæ, thorax, breast, and legs, red, tarsi black. 2½–3: 1¼–1½—*Steph.* *Car. cyanocephalus*, *Don.* iii. pl. 86. *Marsh.* *Leb. chlorocephala*, *Gyllen.* *De Jean.*

Head bluish-green, with rather large and deep punctures; two first joints of the antennæ and base of the third rufous; the remainder, together with the palpi, black: thorax wider than long, narrowed behind, the hinder angles acute, and the margin between them produced somewhat in the form of an arch; of a clear rufous colour, punctate, and having a channel down the centre: scutellum the colour of the thorax: elytra oblong-quadrate, emerald-green, often tinged with blue, having eight faintly punctate striæ on each, the interstices flat and punctulated; marked with two small punctures near the third stria, and a row of large impressions along the outer margin: thorax and breast rufous: abdomen black-blue; legs rufous, tarsi blackish.

Not very common, but occurring at times under stones on dry banks, and in woods. In the south of England, where it is more common than in Scotland, it usually frequents broom. By the side of Braid Burn, and on Braid Hills. Bells Mills.

FAMILY—SCARITIDÆ.

Almost all the genera of this family (10 in number, in the system of Dejean,) were constituent portions of the old genus *Scarites* of Fabricius and Olivier. They possess several characters in common. The exterior palpi are not subulated or awl-shaped at their extremity. The elytra are not terminated by a truncation. The abdomen is separated from the thorax by an obvious intermediate neck-shaped portion*. The first article of the antennæ is always the largest. The anterior legs are often broad and palmated, and strongly notched interiorly. The anterior tarsi generally present no marked disparity in the sexes, and are unprovided with brushes beneath, being simply ciliated †.

The characters given to the two following genera, will shew that the insects included in the above family are conspicuously distinguished from the other conterminous groups. As they are destined to live chiefly beneath the surface of the earth, their structure is more peculiarly adapted than in the other Coleoptera to a subterranean mode of life. The body is narrow and cylindrical, the anterior thighs thickened, the tibiæ dilated and furnished with strong spines, presenting a broad surface well fitted to remove the soil; the head and thorax are strong, and the latter is attached to the abdomen by a short peduncle or footstalk. In the last-mentioned particular they differ from most other pentamerous beetles, which usually have the thorax closely applied to the abdomen, and the hinder angles rectangular or even salient, which necessarily prevents any considerable degree of lateral motion. But in insects which excavate holes scarcely exceeding their own body in width, some provision is necessary to enable them to turn the anterior portion of their body in different directions, otherwise their progress must be nearly in a straight line. This object, which is analogous to that which is provided for in moles and other burrowing quadrupeds by the flexibility of the vertebral column, is attained by the interposition of a narrow cylindrical piece between the abdomen and thorax, on which the latter moves as on a pivot, its hinder angles being rounded off that its motions may be performed with greater facility. The form of the antennæ is likewise in beautiful accordance with the habits of the insects. They are composed of nearly globular articulations attached to each other by a slender filament, bearing some resemblance to a series of beads rather loosely strung. By a structure of this kind they are rendered greatly more pliant and flexible than in the other Pentamera, the joints of whose antennæ are generally conical, and they do not therefore present any obstacle to the insect's progress through a resisting medium.

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* The foreign genus Ozæna, in which the peduncle is scarcely perceptible, may be regarded as an exception to the last-named character.

† *Species General*, t. 1. p. 355.

GENUS—CLÍVINA, *Latreille.* The name of an augurial bird mentioned by Pliny. Except in a few old editions of that author it is written Clivia.—Antennæ moniliform, except the three lowest joints; the basal joint longest, rather robust, the two following of equal length and somewhat obconic, the terminal joint subovate (Pl. I, fig. 3): external palpi long and robust, the terminal joint longest, thick before the base and attenuated to the apex; internal slender; labial with the last joint longest, somewhat cylindric and attenuated at the tip: mandibles with a few small teeth behind the middle: body linear-elongate: thorax quadrate, attached to the abdomen by a narrow peduncle: anterior tibiæ dilated and palmated externally; the tarsi slender in both sexes.—*Curtis, B. E.* iv. 175.

C. Fóssor.—Brownish-black, with the mouth, antennæ, and legs rufous; elytra punctate-striate, of the same colour as the thorax.—2½–3¼ : ¾–1. —*Leach. Cl. arenaria, Lat. Teneb. Fossor. Linn. Car. distans, Marsh.*

Head piceous, with a deep longitudinal impression on the inner side of each eye, and a small oblong one in the centre; antennæ, palpi and mandibles pale testaceous, the latter blackish at the tip: thorax with the hinder angles obliquely rounded; pitchy-black, rather convex, having a slightly arched transverse line near the anterior border, and a deep channel down the centre, between which and the basal angles there is sometimes observable, particularly in large specimens, a faint linear impression: elytra the colour of the thorax, having eight punctured striæ on each, the third with four remote impressed dots, and the outer margin with a continuous series: wings short or imperfect: under side of the body pitchy-black, the segments of the abdomen with a cross line on each, and two impressed dots (spiracles) with a hair in their centre: legs ferruginous red, the thighs of the fore-pair very thick.

Under stones in moist sandy places, plentiful in the spring and summer, both in this neighbourhood and throughout the south of Scotland. Field opposite the Clinkstone Quarry in Blackford Hill. King's Park. Braid Hills, &c. General over all the Grampian range. It frequently occurs of a uniform pale colour, occasioned by immaturity.

C. colláris.—Head and thorax brownish-black, elytra chestnut colour. 2½–2¾.—*Herbst. Curtis, B. E.* iv. 175.—*Steph. Illus.* i. pl. 3, f. 3.

Rather smaller than the preceding, the head and thorax marked in a similar manner, and of a shining blackish or pitchy-black colour; the antennæ and palpi usually pale rufous: elytra reddish chesnut colour, striated and punctured as in *C. Fossor:* wings perfect or nearly so: under side of the body pitchy-black: legs pale rufous.

Under stones on the banks of the Almond, and occasionally on those of the Esk. This is by no means a very scarce insect in the south of Scotland, usually frequenting the banks of rivers, although we have sometimes met with it in dry fields and places of considerable elevation. It occurs rather plentifully by the sides of the Tweed below Innerleithen, and on the banks of the Teviot in various places. In the latter situation we have taken an immature variety entirely pale castaneous, a state in which it is not easily distinguished from pale-coloured specimens of *C. Fossor;* and another variety with a wide patch of brownish-black on the disk of the elytra, corresponding to that which Megerle has described as a species under the name of *C. discipennis.*

GENUS—DÝSCHIRIUS, *Bonelli.* Named from *δυς, two,* and *χιρας, a division of the foot* or *leg,* in allusion to the structure of the anterior tibiæ.—Antennæ moniliform, except the four lowest joints; the basal joint somewhat ovate, the 2d as long, or rather longer than the 1st, 3d and 4th shorter, the remainder somewhat orbicular or slightly cup-shaped, the terminal one conical: external palpi with the 1st and 3d joints minute, the 2d and 4th dilated, the latter terminating in a point: labial palpi with the terminal joint dilated, ovate, acuminated: anterior tibiæ notched on the inner side, and having a long spine at the apex externally, and sometimes one or two smaller ones behind it: tarsi slender in both sexes.—*Curtis, B. E.* viii. 354.

D. áeneus.—Brassy-black above, the anterior tibiæ with two spines at the apex, and two small teeth on their external edge, elytra oblong-ovate, punctate-striate, base of the antennæ and legs rufo-piceous. 1½–1¾ : ⅓–⅔. —*Clivina ænea, Zeigler. De Jean.*

Forehead with a deep longitudinal impression over each eye; mouth piceous, base of the antennæ ferruginous: thorax wider than the head, bronzed, sometimes rather obscure, very convex above, with a faint slightly arched transverse line in front, and a longitudinal one in the centre: elytra rather wider than the thorax, brilliant brassy, rather deeply punctate-striate, the 3d stria with larger impressed dots, usually three in number: body beneath shining-black, scarcely tinted with brassy: legs pale brown or ferruginous, the thighs more or less brassy.

Found on dry sand-banks, and on the margin of ponds, but is not common. Sandstone quarry on the shore at Joppa.

D. gíbbus.—Shining black, elytra ovate, subglobose, striate-punctate, the striæ obliterated at the apex. 1¼ : ½.—*Steph.* *Cl. gibba, De Jean.*—*Car. remotus, Marsh.*

Shining black, very faintly bronzed; head marked as in the preceding species, the thorax shorter and more globose, the transverse line scarcely perceptible, and the central one very faintly marked: elytra scarcely longer than the head and thorax, ovate, convex, with striæ composed of deep and rather large punctures which become obsolete a little beyond the middle, leaving the apex and outer margins of the elytra smooth: legs rufo-piceous: anterior tibiæ with two spines at the apex, and two inconspicuous teeth on the outside.

Considerably more frequent than the preceding, and occurring in similar situations. Moist sandy spots among the Pentland Hills. Marshy ground on the west side of Arthur's Seat, &c.

The only other species ascertained to inhabit Scotland is *D. nitidus*, the largest of the genus in Britain, which occurs at Raehills in Dumfries-shire.—*Clivina arctica* of Gyllenhall and De Jean, which however is more nearly related to the present genus, appears to be rather less unfrequent in Scotland, than it is described to be in the more northern parts of the Continent of Europe, to which it was thought, till lately, to be exclusively confined*.

FAMILY—HARPALIDÆ.

The insects of this family are less ferocious than those of the preceding. "Some of the species," Mr Stephens observes, "are of brilliant metallic colours, but the prevalent hue is black and sombre; whence they have been termed Amaurona by Kirby; and, from the similitude of their colouring to our notions of that of the 'fell demon of darkness,' they have received, in several parts of the country, the name of *imps*†. They run with celerity, and many of the species fly well; whereas the majority of certain groups are perfectly apterous. The larvæ reside in common with the imago, beneath stones, feeding voraciously on other larvæ and small insects; they are generally elongate, cylindric, or a little depressed; the body is composed of twelve scaly rings, exclusive of the head, which are slightly sericeous; the terminal joint is rough, with tubercles on the sides, and the tip armed with two small emarginate processes; the head is small, and furnished with several little shining eminences, which occupy the situation of the eyes; the mouth nearly resembles that of the perfect insects, and the body is less scaly beneath than above. Latreille justly remarks, that the study of this family is attended with great difficulty, as the species are so numerous, and similar in their general form and colours, that it is impossible to fix the limits of the various groups, of which the Harpalidæ evidently consist." *

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* This fine insect has recently been separated from the Clivinæ, and judiciously made the type of a new genus. As the only description which has appeared in English is not likely to be readily accessible to many who may now be enabled to meet with the insect in some of the pretty numerous localities which we have it in our power to point out, it may be of advantage to introduce a short notice of its principal characters:

GENUS—LEIÓCHITON, *Curtis.* Named from λειος smooth, and χιτων a covering, the surface being remarkable for its glossiness.—Antennæ moniliform, except the four lowest joints, of which the basal one is longest and most robust, 2d shortest, the terminal one elongate-ovate: external palpi with the terminal joint subcylindrical, truncate at the tip: labial palpi with the terminal joint considerably longest, subfusiform, truncate: anterior tibiæ deeply notched on the inside, and the three basal joints of the tarsi dilated and somewhat crescent-shaped in the male.—*Curtis, B. E.* viii. 346.

L. árcticus.—Bronzed-black, slightly coppery, extremely glossy and brilliant; head with a transverse impression and an oblong foveola on each side; palpi and antennæ ferruginous: thorax very convex, subglobose, suddenly contracted behind into a narrow cylindrical peduncle, which makes it appear remote from the elytra, and impressed in the middle with a very faint longitudinal line, which is slightly wrinkled across: elytra oblong-ovate, very convex and highly polished, with two or three punctured striæ on each side of the suture, the outermost of which is obsolete behind the middle: under side of the body brownish-black, sometimes reddish, very glossy: legs ferruginous. 3–3¾.—*Scarites arcticus, Payk. Cliv. arctica, De Jean. Gyllen. Oncoderus chalconotus, Steph. Nom.*

We took this highly prized species with great pleasure on the north side of the valley of Clova, above the Kirktown. We have likewise ascertained its existence on Ben Lomond, Windlestraw Law, in Selkirkshire, and Hartfell in Dumfries-shire. We apprehend that the *L. Readii* of Curtis (*B. E.* pl. 346) is nothing more than a slight variety of the above species.

† "*Many* of the species are greatly infected with Gordii, a fact so generally known to the

GENUS—BRÓSCUS, *Panzer.*—Antennæ filiform, slender, shorter than the head and thorax; 1st joint robust, three following clavate, the 3d longest, the rest obconic, terminal ovate: external palpi with the 2d joint long, clavate, bent; 3d and 4th nearly of equal length, the former obconic, the latter subcylindric, truncated at the apex; labial, with the penultimate joint long and clavate, the terminal one narrow at the base, and widened from the middle to the apex, where it is truncated: mentum with an undivided tooth in the centre of its notch: thorax very little wider than the head in front, much narrowed behind, and attached to a narrow projection from the abdomen, which forms a short peduncle: three first joints of the anterior tarsi dilated in the males.

B. cephalótes.—Elongate, black, head thinly punctured, elytra very finely punctate-striate. 8½–10 : 2½–3¼.—*Car. cephalotes, Linn. Marsh. Don. Cephalotes vulgaris, Bon. De Jean.*

Shining black on the head and thorax, the elytra somewhat duller; head large, not contracted behind, thinly punctured, and having an impression on each side anteriorly; palpi brown-black, the tips of the joints pale: thorax convex, narrowly margined, without hinder angles, the surface finely wrinkled across; the centre channelled, and the front and base pretty strongly punctate: scutellum placed on the contracted circle which supports the thorax, of a triangular form, with rounded sides, and two small impressions: elytra rounded on the shoulders, moderately convex above, with nine very faint punctured striæ, and remote impressions along the external border: under side of the body and legs black; the anterior tibiæ armed with two strong spines internally.

Plentiful under stones and marine rejectamenta on the shore between Portobello and Musselburgh; also between Newhaven and Cramond. The attitude this insect assumes when disturbed, is rather peculiar. The two anterior pair of legs are brought close together, and extended straight

'companions of my youth,' that whenever an 'imp' was seen basking in the sun, it was immediately subjected to the ordeal of a pool of water, for the purpose of ejecting the *serpent* (thus called) from his lurking-place; an incident I record with pleasure, as it is not only the oldest entomological fact that is imprinted on my memory, but is associated with my earliest impressions."

* *Illustrations of British Entomology*, vol. i. p. 66.

outwards at right angles with the under surface of the body. The hind legs are bent upwards, and project in a similar way from the opposite surface. The antennæ are drawn close to the sides of the thorax, and the mandibles extended to their utmost stretch, while a considerable degree of rigidity is imparted to the whole. It takes this posture most readily in cold weather; at other times, when more active, it prefers seeking safety by flight, or by burrowing in the sand. "The habit of these insects is very curious; they are found only in the sand on the sea-shore, and live in dens about three inches deep and half an inch wide, which are made in a diagonal position in the sand, where it is mixed with decomposed stalks of *Elymus arenarius* (*Carex arenaria* and *Arundo arenaria* in this neighbourhood). They appear to rove during the day occasionally, but, upon any alarm, they run swiftly to their dens,—projecting from the mouths of which their heads may be seen watching for prey. On holding another beetle to the hole, the one within would immediately seize hold of it with its jaws, and continue so tightly fixed, as to suffer itself to be drawn out, without quitting its hold. They appear to be very ferocious insects; and from the number of elytra and other parts strewed about the sand, it may be supposed that they prey on each other."* The latter observation, we may remark, applies to many insects, although the human race (certainly in that respect the most noted) have been supposed to present the only instances of identical species of animals waging war upon each other.

> "Even tiger fell and sullen bear
> Their likeness and their lineage spare,
> Man only mars kind nature's plan,
> And turns the fierce pursuit on man." †

The natural position of the present genus seems to be that assigned it by Mr Curtis, viz. between the Scaritidæ and the species which we have placed at the head of the succeeding genus. In common with the former, Broscus possesses an elongated form, rather short stout legs, and a pedunculated thorax, which adapt it to a subterraneous mode of life. In the latter the thorax is also pedunculated, and the legs thick and strong; while the more rigid structure of the antennæ, admitting less easily of being applied to the sides of the thorax, to facilitate progression in a cylindrical hole, together with the general configuration of most of the other parts, assimilate it more decidedly to the other Feroniæ, to which its habits perfectly correspond.

Genus—FERÓNIA, *Lat.*—Antennæ filiform, compressed towards the apex, which makes them appear setaceous when viewed from above; 1st joint stout, 2d shortest, 3d usually rather longest, the remainder rather shorter than the 3d, equal, terminal ovate: external palpi with the first joint small, 2d rather longest, robust, bent; 3d clavate, somewhat longer than the 4th, which is cylindric-truncate; labial with the terminal joint scarcely shorter than the penultimate, cylindric-truncate, rather narrowed at the base: mentum with a notch.

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* *Entomological Magazine*, No. 1. p. 92.

† *Rokeby*, Canto iii.

ed or bifid tooth in the centre: thorax narrower than the elytra: thighs strong: the three first joints of the anterior tarsi dilated in the males.

A. *Thorax with the hinder angles rounded.*

F. mádida.—Shining black, elytra ovate, rather convex, subpunctate-striate, with a puncture on the third interstice a little behind the middle. 7–8: 2½–3.—*Car. madidus, Fab. Marsh. Feronia concinna, De Jean.*

Head faintly impressed on each side between the antennæ; the latter black, rufescent at the tip; palpi reddish-brown: thorax rather convex, contracted behind, the sides rounded and margined; the disk wrinkled across, the centre channelled, and each of the hinder angles with a large round fovea, having two longitudinal impressions in the bottom; the hinder angles rounded: elytra rather remote from the thorax, ovate, convex, deeply striate, the striæ smooth or subpunctate, with a short one near the scutellum, and a close row of impressions along the outer margin; the third interstice with a puncture near the second stria behind the middle: under side and legs black.

Var. *b.* Thighs, and sometimes the tibiæ, rufous. This variety constitutes the *Car. madidus, Fab.; Fer. madida, De Jean,* and is regarded as a distinct species by continental authors.

Both varieties are among the most common of the *Harpalidæ*, occurring beneath stones, at the roots of trees, &c. both on low grounds, and on mountains. Germany seems to be the only country in Europe where they are not common. The south of France produces a large and strong variety, which was at one time considered specifically distinct, and named *F. valida* by the Count De Jean. *Feronia Æthiops* (*Steropus concinnus, Curtis*, B. E. 171.), a species nearly related to the preceding, occurs in the southern district of Scotland, but appears to be rare. Mr Duncan has taken examples near the village of Denholm in Roxburghshire, and has seen a few others from the more northern counties.

B. *Thorax with the hinder angles acute.*

F. Nígrita.—Shining black, thorax subquadrate, narrowed behind, elytra with obsoletely punctured striæ, and three impressed dots on the disk. 4½–5: 1½–2.—*De Jean. Omaseus Nigrita, Steph. Car. aterrimus, Payk. Marsh.*

Entirely shining black, the apex of the palpi pale: head impressed on each side anteriorly: thorax rather wider than long, the sides rounded and acutely margined, the hinder angles with a large punctate fovea, having two nearly obsolete impressed lines in the bottom; the dorsal line rather strongly marked: elytra moderately convex, not much wider than the front of the thorax, striated, the striæ scarcely punctured, a short one at the scutellum, and a row of impressions on the external margin; the disk with three large remote punctures, one on the 3d stria towards the base, and two further back on the outer margin of the 2d: under side and legs shining black.

Of frequent occurrence in all parts of the country.

F. Orínomum.—Shining black, often faintly tinted with brassy, elytra striated, with more than four impressed dots on the disk of each. 5–5¼: 1¾–2. *Omaseus Orinomum, Steph. Illus.* i. 114. *Om. Bulwerii, Steph. Illus.* pl. 7. f. 2.

Shining black, very often with a brassy tint, particularly on the elytra: head smooth, with two pretty deep frontal impressions; palpi and antennæ black; thorax faintly wrinkled across, with a line down the middle, and a deep fovea near the hinder angles, which are sometimes sparingly punctured, at other times nearly free from punctures: elytra very slightly sinuated at the extremity, making the apex appear subacuminated, with slightly punctured striæ, and a series of impressed dots, from 5 to 8 in number, some on the 3d, others on the 2d stria, that next the base remote from the rest, and always placed on the 3d stria; the outer margin with the ordinary row of impressions: under side and legs glossy black.

Inhabits the Pentland Hills, but not very plentifully, in places where the soil is composed of peat-earth, particularly near the summit of the eastern elevation. By the comparison of a series of specimens from Clova, Braemar, Ben Lomond, and other places where the insect occurs in considerable abundance, we are convinced that *Om. Bulwerii* of Stephens is not specifically different from *O. orinomum*. In many instances, the characters supposed to be distinctive of the two as species, are interchanged; the brassy gloss frequently accompanying a series of discoidal impressions exceeding five in number (in several of our specimens there are seven, in a few eight), while not more than five or six impressions appear on individuals, in which the metallic lustre is scarcely or not at all perceptible.

F. melanária.—Apterous, black, moderately convex, thorax with a bistriated fovea in each of the posterior angles, elytra with striæ nearly impunctate. 6–8½ : 2½–3.—*De Jean. Car. mel. Illig. Car. angustior, Marsh.*

Shining black; head with the usual frontal impressions; tips of the joints of the palpi pale: thorax a little narrowed behind, the sides rounded, and rather widely margined, wrinkled across, with a central channel, and a punctured fovea on each side behind, having two deep longitudinal impressions in the bottom; the hinder angles acute, somewhat prominent: elytra with nine rather deep striæ on each, and a short one by the side of the scutellum, generally impunctate, sometimes very slightly punctured, the second stria with two remote dots, and the margin with a continuous series: under side and legs black, the hairs of the tibiæ and the claws reddish.

Pretty frequent under stones in fields and woods.

F. nígra.—Winged, black, rather depressed, thorax nearly quadrate, elytra with deep impunctate striæ. 8–10 : 3–3½.—*De Jean. Platysma niger, Steph. Car. niger, Fab. Car. leucopthalmus, Oliv.* iii. pl. 1. f. 4.

Generally considerably larger than the preceding; head finely punctured, impressed in a similar manner; palpi with the tips of the joints pale: thorax nearly square, flat behind, a very little dilated anteriorly on the sides, which have the margin reflexed; the surface wrinkled across, the centre channelled, and the basal foveæ shallow, with two deep impressions, of which the interior one is longest, and rather oblique: elytra deeply striated, or nearly sulcated, with a short one at the scutellum; the striæ sometimes slightly crenated on the edges; the third interstice with three remote punctures, and the margin with a continuous series of ocellated points, closest towards the apex: under side and legs black, ciliæ and claws rufous.

Not very scarce under stones, withered leaves, &c. in woods and waste places. Road side along the shore east of Leith. Slateford. Restalrig, &c.

SUBGENUS—ABÁX, *Bonelli*.—Antennæ and palpi as in the preceding genus, except that the two terminal joints of the external palpi are of equal length: thorax quadrate, as wide as the base of the elytra; *the latter short,* depressed.

A. striola.—Shining black, thorax with two longitudinal impressions on each side behind, elytra with a carina on the shoulder. 8–9 : 3½–4.—*Car. striola, Fab. Car. depressus, Oliv.* iii. pl. 4. f. 46. *Marsh.*

Head with two deep frontal impressions, and a few longitudinal folds over the eyes; palpi brownish-black, with the tips of the joints reddish: thorax wider than long, nearly quadrate, scarcely narrowed in front, with the anterior angles deflexed; the sides margined, the base emarginate in the middle, the angles acute; the surface wrinkled across, the centre channelled, and the basal angles impressed with two long, deep, impunctate foveæ: elytra not much longer than the head and thorax, depressed, with smooth or subpunctate striæ, and a short one near the scutellum; the interstices flat, the seventh elevated at the shoulder and apex into an acute keel; the striæ bounded anteriorly by a smooth transverse space on each side of the scutellum, which forms a small projecting tooth where it meets with the lateral margin: under side and legs black.

Has been taken once or twice near Edinburgh, in Dumfries-shire and Argyllshire; but it is very scarce in Scotland.

Subgenus—**PŒCILUS**, *Bonelli.* Named from ποικιλος, adorned with various colours.—Antennæ and palpi nearly as in *Feronia;* the third joint of the former distinctly longest, and the second very short; the second and third joints of the external palpi nearly of equal length; mentum with the central tooth sometimes obtuse, at other times notched: thorax rather narrower than the abdomen, the hinder angles acute.—*Curtis, B. E.* iv. 187.

P. cúpreus.—Brass or copper green above, the thorax punctulated beneath, underside and legs black, the two basal joints of the antennæ entirely rufous. 4–6 : 1½–2½.—*Car. cupreus, Linn. Marsh. Don.* xvi. pl. 554.

Very variable both in size and colour; usually of a shining green, more or less tinted with brassy or coppery, sometimes violet colour, and occasionally deep black: head oval, very minutely punctured, with two shallow frontal impressions; palpi and antennæ blackish, the two basal joints of the latter rufous: thorax margined on the sides, convex anteriorly, and nearly smooth, the base punctulated; with a faint central channel and two punctate foveæ on each side behind, the inner one twice the length of the other: elytra a little wider than the thorax, moderately convex, with nine nearly smooth or punctulated striæ, and a short one near the scutellum; the third interstice with three or four dots behind the middle, and the margin with the usual series: under side and legs usually bronzed black; the sides of the thorax, and of the abdomen at the base, punctured.

A very common insect throughout the country. It inhabits all parts of Europe, and according to De Jean has been found in North America. *P. rufifemoratus* of Steph. Illus., distinguished from the above by its rufous thighs, has been found in Scotland, and affords, there can be little doubt, an additional example of the great variety of colouring to which *P. cupreus* is liable.

P. versícolor.—Changeable in colour, thorax smooth beneath, the two basal joints of the antennæ rufous, with a narrow elevated black line on the upper side. 3½–5½ : 1¼–2¼.—*Ziegler. Steph. Sturm's Deut. Faun.* pl. 120, *f, b, c.*

Very brilliant above, and still more variable in colour than the preceding, but the prevailing tints are similar: head and thorax impunctate, marked, in other respects, nearly as in *P. cupreus;* the thoracic foveæ rather more coarsely punctate: elytra striated in the same manner, the striæ more obviously punctured, the third interstice with 2–6 dots: body beneath jet black, the breast punctate; the sides of the thorax glossed with green, impunctate: legs, palpi and antennæ black, the latter with the two lowest joints rufous, having a narrow dusky line on the upper side, often, however, very indistinct.

Appears to be pretty frequent in Scotland: it has been taken among the Pentland Hills, and other places in the neighbourhood, and it occurs plentifully among the Badenoch Hills in Inverness-shire, and other parts of the Highlands. By the above characters, it will be seen that it differs but slightly from *P. cupreus*, of which species we are disposed to consider it as constituting one of the variously modified forms; but the decided opinion of Mr Stephens, founded on the examination of a very extensive series of specimens, has induced us to give it as distinct.

P. dimidiátus.—Head and thorax cupreous, the latter deeply bistriated at the base, elytra brassy-green, antennæ with the two basal joints rufous beneath. 5⅓–6⅓ : 2–2¼·—*Car. dimid. Oliv.* iii. pl. 2. f. 121. *Marsh.*

Head and thorax usually brilliant coppery-red, more or less tinged with green; the former very obsoletely punctured, and faintly impressed on each side anteriorly; antennæ with the two first joints brownish-black above, rufescent beneath, the rest blackish; thorax somewhat rounded on the sides, not narrowed behind, transversely wrinkled, with a line down the centre, and two deep foveæ on each side behind; the front smooth, the hinder margin punctate: elytra shining green, with rather strongly marked punctured striæ, the interstices slightly convex, the third with 3–5 dots, and the margin with an interrupted row: thorax beneath and breast dark greenish-bronze; abdomen and legs black.

Not common: has been taken near Corstorphine, and by the side of the Water of Leith to the west of Edinburgh.

GENUS—ARGÚTOR, *Megerle.*—Antennæ filiform, the 1st joint robust, rather longest, 2d shortest, 3d scarcely longer than the following, terminal ovate: external and labial palpi with the apical joint fusiform truncate: mandibles with a tooth at the base: thorax heart-shaped, truncated behind, the angles acute: anterior tarsi with three dilated joints in the males.—*Steph. Illus.* i. 102.

A. púllus.—Shining black, antennæ and legs ferruginous, thorax impunctate beneath, the striæ on the elytra slightly crenated. 3 : 1¼.—*Steph. Har. pullus, Gyllen.* iv. 429.

Glossy black; head with two frontal impressions; mouth, palpi, and basal joints of the antennæ, pitchy-red: thorax rounded on the sides, the hinder angles acute, somewhat prominent, with a dorsal channel, and a long deep punctured fovea on each side behind: elytra with deep striæ, and a short one near the scutellum; the sides of the striæ crenated; the 3d interstice with three punctures, and a series along the outer margin: under side shining black, the sides of the thorax without punctures; legs ferruginous, the thighs often blackish.

Not common: has been taken at the west end of the Pentland Hills.

A. erýthropus.—Pitchy black, legs rufous, thorax punctured behind, elytra with punctulated striæ. 2¾–3¼ : 1¼–1½.—*Steph. Car. erythropus, Marsh.*

Shining pitchy black; head and thorax nearly as in the preceding, the hinder margin of the latter punctured: elytra deeply striated, with an abbreviated stria near the suture at the base, the striæ with small punctures:

under side of the body shining black, legs rufous; antennæ piceous, with the basal joints rufescent.

Pretty frequent beneath stones in sandy fields and gravelly places. King's Park. Fields about Braid, &c. The *Feronia erythropus* of De Jean is an American species, quite distinct from the above.

GENUS—PÁTROBUS, *Megerle.*—Antennæ filiform, the basal joint rather robust, 2d shortest, 3d longest, the remainder of equal length, the terminal one conical: external palpi with the 2d joint longest, 3d and 4th of equal length, the latter fusiform; labial with the terminal joint fusiform-truncate, as long as the 2d and 3d united: mandible with a few irregular teeth near the base: mentum with a notched tooth: thorax subquadrate, narrowed behind, the sides convex: anterior tarsi of the males with two dilated triangular joints.—*Curtis, B. E.* iv. 192.

P. rúfipes.—Apterous, pitchy-black above, paler beneath, antennæ and legs rufous. 3½–4 : 1¼–1½.—*De Jean. Car. rufipes, Fab.*

Head triangular, with a strong impression on each side anteriorly, and a deep punctured line behind the eyes, contracting the hinder part into a short neck; palpi and antennæ ferruginous-red, the latter pubescent, except the two basal joints: thorax as long as broad, with the dorsal line deeply impressed, and rather widened behind, a punctured arched impression in the front, leaving the margin itself smooth, and a deep punctate fovea at each of the hinder angles, the latter acute: elytra oblong, widest behind the middle, punctate-striate, the striæ deep at the base, but rather faint towards the apex and sides; with a short stria in the scutellar angle, three remote impressions on the 3d interstice, and a marginal series: under side ferruginous-red, often obscure; thorax punctate beneath: legs rufous. —It is found at times entirely of a pale ferruginous colour.

Fields near Dreghorn; banks of the Esk near Dalkeith, and elsewhere, occasional. It is a very common insect in the central parts of Roxburghshire, and many other places in the south of Scotland. It is likewise abundant among the Grampian Mountains.

The only other British species appears to be confined to Scotland. It is the *P. alpinus* of Curtis (B. E. iv. 192.), *P. septentrionis* of De Jean, distinguished from the above by its transverse thorax, which, as well as the head, is of a dusky hue,—by its superior size, and by being furnished with wings. It occurs plentifully on Ben Lomond, and has been taken near Inverary, on the Clova mountains in Forfarshire, and on Windlestraw Law in Selkirkshire.

GENUS—STÓMIS, *Clairville.*—Antennæ filiform, rather long, 1st joint robust, considerably longest, 2d short, 3d nearly as long as the following which are equal: palpi long, the external pair with the 2d joint long and clavate, 3d short obconic, 4th scarcely twice the length of the 3d, ovate-truncate: labial with the last joint thickened from before the middle to the apex, which is truncate: mandibles very long, standing out from the head, narrow, curved, without teeth, the right one notched in the middle: thorax longer than broad, narrow behind: anterior tarsi of the male with three dilated joints.

S. pumicátus.—Pitchy-black, with the palpi, antennæ, and legs rufous. 3–3¼ : 1–1¼.—*Clair.* v. ii. pl. 6, f. A. a.—*Car. tenuis, Marsh.*

Shining brownish-black; head with two rather oblique impressions between the antennæ, and a very indistinct rounded mark in the middle, a little farther back; mandibles ferruginous; thorax rounded on the sides and narrowly margined, the disk rather convex, and faintly wrinkled across, with a deep central line, and a long narrow impunctate fovea near each of the hinder angles; the latter acute: elytra a little remote from the thorax, oblong-ovate, with nine punctured striæ, the 2d from the margin foveolated, scutellar angle without a short stria: underside of the body reddish-brown; the sides of the thorax punctured; legs rufous; the anterior tibiæ deeply notched.

Not very frequent, but occurring at times under stones during the spring months. Banks of the Water of Leith, occasional.

GENUS—**HÁRPALUS**, *Latreille.*—Antennæ filiform, about the length of the head and thorax, pubescent, with the two basal joints naked; 1st joint robust, cylindric, longest; 2d shortest, 3d rather longer than the 4th, the rest equal, terminal ovate: external palpi with the 2d joint longest, the 3d and 4th nearly of equal length, the latter more or less elongate-ovate, sometimes nearly cylindrical, truncate at the tip: labial palpi with the terminal joint fusiform truncate, about the length of the preceding joint: mentum deeply emarginate, with a very small simple tooth in the centre: thorax somewhat quadrate: all the tarsi dilated in the males, except the hinder pair.—*De Jean, Spec. Gener.* iv. 191.

A. *Elytra punctulated.*

a. *Head and disk of the thorax punctate.*

H. puncticóllis.—Brownish-black above, piceous beneath, thorax deeply punctured, elytra simply striated, the interstices punctulated, antennæ and legs pale rufous. 2½–4: 1–1½.—*De Jean. Sturm, Deut. Faun. Ophonus puncticollis, Steph.*

Slightly pubescent; head and thorax sometimes a little reddish, the former with small scattered punctures; mouth pitchy-red; palpi and antennæ of a paler hue: thorax wider than long, narrowed behind, the sides more or less rounded and margined, the surface covered with rather large punctures, somewhat remote from each other on the disk, but close placed behind; the centre faintly channelled, the angles scarcely foveolated: elytra dull black, with nine impunctate striæ, and a short one at the base between the first and second, the interstices nearly flat, punctulated, the margin with a row of larger points, interrupted in the middle: under side pitchy-red, punctulated; legs pale rufous.

Not unfrequent under stones in loose sandy soils. Salisbury Craigs. Shore near Newhaven, &c. *Ophonus foraminulosus*, Steph. Illus., which was found by Dr Leach on the Calton Hill, does not differ materially from the above.

H. pubéscens.—Piceous or pale ferruginous, thickly punctured and pubescent, the thorax with an impression on each side behind, the striæ on the elytra obsoletely punctate. 2¾–3: 1–1¼.—*De Jean. Oph. pubes. Steph.*

Usually smaller than the preceding, and proportionally more elongate; the colour often pale ferruginous, with a dark line along the middle of the head and thorax, and a patch of the same colour on the elytra behind; head punctate, with two frontal impressions; palpi and antennæ rufescent: thorax short, rounded on the sides anteriorly, and narrowed behind, with a dorsal line and a rather deep oblong impression near the basal angles; the surface punctate, not very closely: elytra with very slightly punctured striæ, the abbreviated one near the scutellum wanting, the interstices flat and punctured, the marginal row of impressions interrupted in the middle: under side punctured; legs ferruginous, more or less pale.

A very variable species, both in size and colour: it is not common in Scotland, but has been taken occasionally on the shores of the Firth near Cramond, and in some other parts of the Edinburgh district.

b. *Head and centre of the thorax smooth, or very obsoletely punctulated.*

H. ruficórnis.—Pitchy-black, antennæ and legs rufous, elytra pubescent, striated, the interstices punctured. 5–7 : 2¼–2¾.—*Gyllen.* *Car. ruficornis, Fab.* *Marsh.*

Head smooth and shining, with two impressions in front; palpi and antennæ ferruginous, with a yellowish tinge: thorax subquadrate, rounded on the sides, and margined, somewhat narrowed behind, with acute angles; the hinder part covered with small thick-set punctures, the disk nearly smooth, or very obsoletely punctulated, the front with a semicircular space, slightly elevated, punctured and wrinkled lengthwise; the central line faint, and the basal foveæ rather obsolete: elytra clothed with yellowish pubescence, simply striated, the interstices somewhat convex, and thickly punctulated, the 2d with a short stria at the base, and that next the margin with irregular impressed dots: under side pitchy-black, or reddish; legs yellowish-red.

One of the most common insects of the family. We have received it from the northern extremity of Scotland; it inhabits much higher latitudes on the continent, and has been found in the north of Africa, occurring abundantly in all the interjacent countries.

B. *Elytra not punctulated.*

H. aéneus.—Various shades of green above, with a brassy or coppery lustre, under side black, external margin of the elytra punctulated, antennæ and legs rufous. 4–5 : 2–2¼.—*Gyllen.* *Car. aeneus, Fab.* *Marsh,* *Car. discolor and azureus, Marsh.*

Colour very variable, generally a rich bronzed-green, the males highly polished, the females more obscure, sometimes brownish-black: head with a transverse impression, deepened and dilated on each side; antennæ and palpi ferruginous: thorax nearly square, the sides anteriorly a little rounded, the dorsal line bounded at both ends by an obsolete transverse impression, the anterior of which is arcuate; the hinder angles, sometimes the whole posterior margin, punctate, with a shallow fovea on each side: elytra with nine impunctate striæ, and a short one at the base between the 1st and 2d, the outer margin more or less punctulated, the base very sparingly, and the third interstice frequently with a large puncture behind the middle, near the 2d stria; the apex with a transverse piece cut out, leaving the margin like a salient tooth: under side black or brownish, sometimes glossed with green; legs ferruginous, more or less pale.

Sometimes pitchy-black with the elytra reddish-brown, and the legs piceous, and the antennæ dusky except the basal joints. There are numerous other varieties: one of these, which we have occasionally taken near the shore, agrees perfectly with the description of De Jean's *H. confusus,* except in the want of the dusky spot at the base of the joints of the palpi; and others seem to correspond to those described under the names *concinnus* and *dentatus.*—It is very abundant under stones, in warm sandy places. Mr Kirby once took a specimen of this insect, which he immersed in hot water, and was surprised to see what he at first supposed an intestine thrust itself forth; but, on a nearer inspection, he found it was an intestinal worm, thicker than a horse hair, and of a brown colour.

H. limbátus.—Black, with the antennæ, palpi, margin of the thorax, and legs, rufo-testaceous, the elytra impunctate at the apex. 4–4½ : 1½–1¾.—*Sturm, Deut. Faun.* iv. pl. 85. f. *a*, A. *Gyllen.*

Males shining black, very slightly tinged with blue when alive, females with the elytra obscure: head large, rounded, smooth, with two very small frontal impressions; antennæ and palpi rufous, the mandibles very obtuse: thorax nearly square, very little rounded on the sides anteriorly, scarcely or not at all narrowed behind, the posterior part punctured, particularly towards the angles, where there is a rounded fovea; the colour shining black, narrowly margined on the sides with rufous: elytra impunctate, short, obtuse, the apex somewhat truncated obliquely, and rufescent; striated nearly as in *H. æneus*, the margin with a row of impressions: under side pitchy-black; legs yellowish-red.

Not unfrequent on the Pentland Hills, in the King's Park, and other places in the vicinity. We have taken it on the Eildon Hills in Roxburghshire, and observed it in considerable abundance in many parts of the Highlands of Forfarshire, Aberdeenshire, and Perthshire, during a recent entomological excursion to the north, in company with Dr Graham and a party of his pupils. It frequently occurs of a pale testaceous colour beneath; at other times the head is rufous, and the thorax pitchy-red. In both cases, it is probably recently transformed,—the colours consequently not having acquired their ordinary depth.

H. púnctiger.—Pitchy-black, antennæ and legs of the same colour, elytra striated, the third interstice from the margin with several impressed points. 4½–5 : 1¾–2.—*Steph. Illus.* i. 149.

Head and thorax glossy black, the former with a transverse line in front, and a small impression on each side; the latter wrinkled across in the middle, longitudinally in front, the hinder margin rather sparingly punctured, with a punctate fovea on each side of the dorsal line: elytra with impunctate striæ, and a short one between the 1st and 2d at the base, the 7th interstice from the suture with several impressed dots at the apex, and the usual row along the margin: antennæ and legs piceous.

This species, which is very closely allied to *H. rubripes*, has been taken at Salisbury Craigs, but we have not heard of its occurrence elsewhere in Scotland.

H. rufímanus.—Rather depressed, shining black, the thorax with two obsoletely punctured foveæ behind, antennæ and tarsi rufous. 4–4½ : 1¼–1¾.—*Steph.* *Car. rufimanus, Marsh.*

Narrower and longer in proportion than the two preceding species: black, somewhat shining; palpi and antennæ yellowish-red: thorax smooth, with a faint abbreviated dorsal line, and a very obsoletely punctured fovea on each side towards the basal angles, which are obtuse; the space between the foveæ rather depressed: elytra simply striated, with a short scutellar stria, and a series of large punctures on the outer margin; the apex somewhat truncated obliquely: under side black; legs pitchy-black, the tarsi rufous.

Found occasionally near Edinburgh, and other parts of the south of Scotland, but not in great plenty. Fields near the village of Corstorphine. Slateford, &c. It likewise occurs in more northern districts, on the banks of the Dee near the Castletown of Braemar, at the lower parts of Glen Tilt, and in the vicinity of Blair-in-Atholl.

Besides the above, the only other species of *Harpalus* hitherto ascertained to be Scottish, is *H. rubripes*, which has been found in Dumfriesshire; but it is probable that many others remain to be discovered even in this vicinity, as the genus is a very extensive one, containing, in its most restricted form, about fifty British, and upwards of thrice that number of foreign species.

GENUS—CURTONÓTUS, *Stephens.* Named from κυρτος, *convex*, and νωτος, *the back*.—Antennæ filiform, short, pubescent, with the three basal joints naked; 1st joint rather robust, 2d short, 3d about the length of the 1st, 4th shorter than the 3d, and abruptly clavate: external palpi with the 3d joint long, slender at the base, and thickening slightly towards the apex, terminal considerably shorter, subfusiform truncate; labial, with the terminal joint much shorter than the 3d, subcylindric truncate: mentum with a bifid tooth in the centre: thorax rather transverse, narrowest behind: elytra wider than the thorax, convex: anterior tarsi of the males with three dilated joints; tibiæ very spinose, compressed and dilated at the tip.—*Steph. Illus.* i. 138.

C. aúlicus.—Rather short and convex, of a pitch-black colour, paler beneath, thorax punctured before and behind, elytra punctate-striate, antennæ and legs rufous. 5–6 : 2–2½.—*Steph. Har. aulicus, Gyllen. Car. convexus, Marsh. Amara aulica, De Jean.*

Broad, convex; head rather wide, smooth, with two frontal impressions, united by a cross line; palpi and antennæ ferruginous-red; upper lip reddish-brown: thorax somewhat convex anteriorly, transversely depressed behind, the sides rounded and margined; channelled down the centre, and having two linear impressions on each side behind, the external one with an elevated carina along the outer side; the front and hinder margin punctured, the latter thickly: elytra with nine striæ, faintly punctured throughout their whole length, the 1st forked near the base, the outer margin with a series of punctures at the base and apex, the centre impunctate: body beneath reddish-brown, the sides punctate; legs ferruginous-red, sometimes pale, at other times pitch-black.

Not a scarce insect in the south of Scotland, found usually under stones, and occasionally on plants. Salisbury Craigs. Side of the railway east of Duddingston. Cramond, &c.

C. convexiúsculus.—Elongate-ovate, pitchy-black, with a brassy lustre, thorax punctate behind, antennæ and legs rufous. 5 : 2.—*Steph. Illus.* i. pl. 8. f. 1. *Car. convexiusculus, Marsh.*

Very like the preceding, but proportionally narrower, and slightly bronzed, particularly on the elytra: thorax narrower, more convex, the basal impressions deeper and more strongly punctate, the front smooth: elytra narrower, more elongate than in *C. aulicus*, striated in the same manner, the striæ distinctly punctured towards the base, more faintly towards the apex; the margin with three or four impressed dots at the base, and a series at the apex: under side piceous; base of the abdomen strongly punctured; legs rufous.

Seemingly scarce: we have seen a few examples taken in the neighbourhood, but were unable to ascertain precisely from what particular spot they were obtained.

GENUS—BRÁDYTUS, *Steph.* Named from βραδυτης, in allusion to the sluggishness of their motions.—Antennæ filiform, the three lowest joints naked; 3d longest: external palpi with the 2d joint longest, 3d shorter than the 4th, which is ovate-truncate; labial with the terminal joint fusiform, shorter than the penultimate: mentum with a simple tooth in the centre: thorax transverse, rather narrowed behind, the angles acute: elytra convex: anterior tarsi of the males with three dilated joints.—*Steph. Illus.* i. 136.

B. ferrugíneus.—Ferruginous, thorax with two impressions on each side behind, elytra punctate-striate, with a brassy lustre. 4—5 : 2—2¼. —*Steph. Car. ferrugineus, Linn. Marsh.*

Entirely of a ferruginous colour, palest beneath; the body broad and thick: head short, smooth, obsoletely impressed on each side, with a cross line between: thorax rounded on the sides and acutely margined, smooth, the hinder angles with two short punctured foveolæ and an elevated line between the outer one and the margin; the disk wrinkled across, and the centre rather deeply channelled: elytra faintly tinted with brassy, punctate-striate, the sutural stria forked at the base, the outer margin with a series of impressions at the base and apex: antennæ and legs nearly the colour of the body, or of a paler hue.

This species appears to be confined to the sea-shore in this neighbourhood, where it is found not unfrequently beneath stones. Fisherrow, Granton, &c.

B. apricárius.—Black, tinted with brassy above, pitchy-red beneath, thorax punctate behind, with two punctured foveolæ on each side, elytra crenate-striate. 3-3½ : 1⅓-1⅔.—*Steph. Car. apricarius, Fab.*

Smaller and narrower than the preceding: brassy-brown above; head rounded, smooth, with two round foveæ in the front, connected by a slightly arched cross line: palpi and antennæ ferruginous: thorax nearly square, very little narrowed behind, moderately convex, smooth, with a longitudinal line down the middle, and two oblong punctate foveæ on each side, the outer one with an elevated line externally; the space between the foveæ punctate: elytra striated, the striæ with rather large rounded punctures towards the base, becoming somewhat obsolete at the sides and apex, the outer margin with a row of larger punctures, interrupted in the middle: under side pitchy-red, sides of the breast and abdomen punctate: legs ferruginous.

Occurs in great profusion in this vicinity, and is very widely distributed.

B. consuláris.—Black above, piceous beneath, thorax narrowest in front, elytra crenate-striate, antennæ and legs rufous. 3½-4¼ : 1½-2.—*Steph. Car. latus, Fab. Har. latus, Gyllen. Amara consularis, De Jean.*

Head, palpi, and antennæ as in the preceding species; thorax rather narrowest in front, the hinder angles nearly straight; convex above, smooth and shining, with a narrow dorsal line, and two short more or less punctate foveæ on each side behind, the outer one with a slightly raised oblique line externally: elytra at the base scarcely wider than the hinder part of the thorax, brassy-black, punctate-striate, with a somewhat interrupted marginal series of punctures: under side of the body, and inflected margin of the elytra, reddish-brown; legs ferruginous.

By no means frequent in Scotland, but found now and then under stones in warm sandy places. Road-sides east of Leith. Figget Whins.

GENUS—**AMÁRA**, *Bonelli.*—Antennæ rather slender, about the length of the head and thorax, filiform and pubescent, the three basal joints naked; the 1st joint a little thickened, 2d shortest, 3d very little longer than the three following, terminal one conical: external and labial palpi with the two first joints nearly equal in length, the penultimate clavate, the terminal elongate-ovate, slightly truncate at the tip: mentum with a bifid tooth in the middle: thorax narrowed in front, the hinder part as wide as the elytra, to which it is closely applied: three first joints of the anterior tarsi dilated and heart-shaped in the males.

A. *Elytra with an abbreviated stria near the scutellum.*

A. eurynota.—Ovate, wide, brassy-green above, thorax with two impressions on each side behind, one of them obsolete, three basal joints of the antennæ rufous, legs black. 4½–5½ : 2–2¾.—*De Jean. Car. Eurynotus, Illig. Harpalus acuminatus, Gyllen.*

Variable in colour; usually brassy green above, sometimes cupreous and occasionally blackish: very wide, oval; head smooth, with two small impressions anteriorly, and a narrow transverse line between them; palpi black; antennæ, with the three basal joints, and usually a small portion of the base of the 4th, rufous, the rest dusky: thorax at the base twice as wide as long, much narrowed in front, where the angles are deflexed, the hinder angles acute; moderately convex, wrinkled across, with a dorsal channel abbreviated behind, and an oblong deep impunctate fovea, like a large puncture, remote from the posterior margin, and placed nearly midway between the outer edge and the dorsal line, but rather nearer the latter, and another very indistinct towards the hinder angles: elytra somewhat acuminated towards the apex, where they are slightly sinuated, with nine impunctate striæ, the second interstice widened at the base for the admission of a short stria which is placed obliquely; the margin with an uninterrupted series of impressions: under side black or pitchy-black, glossed with greenish-blue, impunctate; legs black.

Var β. Three basal joints of the antennæ rufescent, with the tips dusky; *Am. aerata, Steph. Illus.* pl. 7. f. 6, *(the legs ought to have been black in the figure).*

Rather plentiful in the neighbourhood and throughout the southern district of Scotland. Salisbury Craigs. Sand-banks near Canonmills. Fields at Craigleith, &c. Var β. has been taken at "Arbroath," *Steph.* and elsewhere.

A. similáta.—Subovate, brownish-brassy above, the thorax with two obsolete punctulated foveæ on each side behind, antennæ rufous at the base, the tibiæ and tarsi pitchy-red. 3½–4 : 1½–2.—*De Jean. Har. similatus, Gyllen.*

Shorter than the preceding and much narrower: head and antennæ nearly the same: thorax smooth, with two impressions behind, the outer one slightly marked, the bottom and sides of both punctured: elytra somewhat shining in the male, rather dull in the female, with striæ deepest towards the apex, disposed as in *A. eurynota*, the bottom and the outer margin with a few impressions: under side of the body and thighs bronzed black; tibiæ and tarsi reddish-brown.

Not unfrequent near Edinburgh in various situations.

A. vulgáris.—Oblong-ovate, brassy-green above, thorax with two nearly smooth obsolete foveæ on each side behind, antennæ and legs black. 3½–3¾ : 1½–1¾.—*De Jean. Har. vulgaris, Gyllen. Car. vulgaris, Linn.*

Usually bronzed green or cupreous above, not unfrequently blackish; the male shining, the female more obscure, particularly on the elytra: head smooth, obsoletely foveolated; mouth, palpi, and antennæ black, the basal joint of the latter pitchy-red: thorax moderately convex in front, the sides and hinder margin slightly depressed, with a dorsal channel and two foveæ on each side behind, which are scarcely punctate, the outer one faint and somewhat oblique: elytra with fine striæ, very faintly punctulate in the bottom, the interstices flat: under side black, slightly bronzed; legs black or brownish-black.

Not very common, but has been taken occasionally along with the preceding species.

A. triviális.—Oblong-ovate, brassy-green above, thorax with a single fovea on each side behind, base of the antennæ testaceous, tibiæ pitchy-red. 3–3¾ : 1½–1¾.—*De Jean. Sturm.* iv. pl. 145. f. *b.* B. *Har. trivialis, Gyll.*

The colour varies as in the last, but it is commonly a brilliant brassy-green above: head smooth, the frontal marks rather faint; mouth and palpi black, the latter with the tips of the joints often reddish; antennæ with the three basal joints, and sometimes the base of the fourth, rufous, the remainder blackish: thorax smooth, the central line faint and abbreviated, with an oblong, narrow, deeply impressed, and nearly impunctate foveola on each side, remote from the hinder margin, and placed towards the middle, the outer fovea obliterated: elytra finely striated, with a short stria placed obliquely at the base of the second interstice, the striæ of equal depth throughout, and very obsoletely punctulated: under side bronzed black; thighs black, tibiæ reddish-brown, tarsi brown.

An exceedingly common insect throughout the summer in pastures and on hill-sides, running about among the herbage during the heat of the day. On the sides of Arthur's Seat, sometimes in great profusion. Braid Hill. Craiglockhart, &c. April—August.

A. commúnis.—Oblong-ovate, brassy or brassy-green above, thorax with two obsolete punctured foveæ on each side behind, base of the antennæ and tibiæ rufous. 2½–3¼ : 1⅓–1½.—*De Jean. Car. communis, Fab. Har. communis, Gyllen.*

Very like the last, but more frequently brassy above: head, palpi, and antennæ similar: thorax subpunctate towards the basal angles, the two foveolæ faintly marked, sometimes entirely effaced: elytra finely striated, the striæ scarcely punctulate and becoming deeper near the apex; under side bronzed-black; thighs black, tibiæ pale ferruginous, the tarsi more obscure.

Likewise a species of frequent occurrence in most parts of the country.

A. familiáris.—Ovate, blue-black or brassy above, thorax obsoletely bifoveolated behind, base of the antennæ and legs ferruginous-red. 2½–3 : 1¼–1½.—*Creutzer. De Jean. Har. familiaris, Gyllen.*

Closely allied to the last, the upper surface very similar, but more frequently of a bluish-black, bronzed: the two impressions on the posterior part of the thorax placed near the hinder margin and subpunctate: under side pitchy-black: legs entirely ferruginous-red.

Rather common. King's Park. Fields and pastures round Edinburgh.

B. *The scutellar angle of the elytra without an abbreviated stria.*

A. tibiális.—Brassy or blue-black above, thorax with two deep impunctate foveolæ on each side behind, antennæ testaceous at the base, tibiæ pitchy-red. 2–2½ : 1–1¼.—*De Jean. Car. tibialis, Payk. Har. tibialis, Gyllen.*

The smallest species of the genus; generally shining brassy above or bluish, but very variable in colour like its congeners: head smooth, faintly foveolated; mouth, palpi, and antennæ black, the three lowest joints of the latter testaceous: thorax with a dorsal channel, and two rather deep impunctate foveæ on each side, situate near the hinder margin; elytra striated, the striæ slightly punctured, the usual abbreviated one at the base of the second interstice wanting; the external margin with a row of large punctures interrupted in the middle: under side and thighs black; tibiæ and tarsi pitchy-red.

Frequent in many places near Edinburgh; in some situations found in great abundance. Musselburgh and Fisherrow Links under stones in the spring, generally very plentiful.

GENUS—CÁLATHUS, *Bonelli.*—Antennæ filiform, slightly compressed, the joints of nearly equal length, except the 2d, which is about half the length of the 1st: external palpi, with the three last joints, and labial with the two last joints, of nearly equal length, the terminal joint truncate: mandibles bent, acute, the base denticulated: mentum with a bifid tooth in the centre: head triangular: thorax sometimes narrowed behind, but generally narrowest in front and widened behind, with the hinder margin straight: claws serrated beneath: anterior tarsi in the males with the three basal joints dilated.—*Curtis, B. E.* iv. 184.

This genus, as Mr Stephens observes, presents a peculiar outline, from the shape of the head, trapeziform thorax, and elliptic elytra, by which it is readily known from the other Harpalidæ; exclusively of its denticulated claws, combined with the bifid central lobe in the emargination of the mentum. The species usually reside among short herbage in banks, and are very frequently observed upon quick hedges. *

A. *Thorax widest behind.*

C. cisteloídes.—Black, elytra faintly punctate-striate, three of the striæ with a series of larger punctures, legs rufous. 4½–6 : 2–2½.—*Car. flavipes, Oliv.* iii. pl. 8. f. 86. *Marsh.*

Head glossy black, with two shallow impressions between the antennæ; basal joint of the latter rufous, the rest brownish-red; palpi of the same colour: thorax likewise glossy, nearly quadrate, rather narrowed in front with the two angles depressed, the basal margin slightly sinuated and punctate; having a dorsal line and an obsolete fovea on each side towards the hinder angles, the angle itself acute and impressed with a large puncture: elytra shining black in the males, rather dull in the females, scarcely wider than the thorax at the base, with nine obsoletely punctured striæ on each, and a short one beside the scutellum, the 2d with a few large punctures near the apex, the 3d punctured in a similar manner before the middle, and the 5th throughout its whole length; the margin with the usual series: under side of the body brown-black; legs rufous, the tarsi dusky. It is apterous.

Plentiful under stones in the King's Park, and other places about Edinburgh, as well as throughout Scotland. A variety with black legs is likewise frequent.

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* *Illus. of Brit. Ent.* vol. i. p. 98.

C. rufángulus.—Pitchy-black, sides and hinder angles of the thorax rufescent, antennæ and legs testaceous. 4½–5½ : 2–2¼.—*Steph. Illus.* i. pl. 6. f. 4. *Car. rufangulus, Marsh.*

Brownish-black; head and thorax nearly as in the preceding, the thorax impunctate, with the sides and basal angles rufous: elytra with impunctate striæ, the interstices flat, the 3d having two remote dots, and the margin a continuous series: under side pitchy-red; antennæ and legs testaceous. Usually provided with wings.

Not common in this neighbourhood, nor seemingly in any part of Scotland. It has occurred near Restalrig, and in a few other places.

C. móllis.—Brown-black, antennæ and legs pale testaceous, thorax with the sides rufescent, the hinder angles somewhat obtuse. 3½–4 : 1½–1¾.—*Steph.* *Car. mollis, Marsh.*

Smaller and more slender than the preceding species; palpi and antennæ testaceous: thorax shining, pitchy-black, with the sides, and sometimes the hinder margin, more or less rufous; the angles behind rather obtuse: elytra with impunctate striæ, the third with two or three impressed dots, and the usual series on the margin: wings perfect: under side pitchy, more or less deep: legs testaceous, often very pale.

A variety occurs entirely of a pitchy-red colour; probably immature. Figget Whins; sand-bank facing the sea, among the matted roots of the *Arundo arenaria* and *Carex arenaria.* It appears to be pretty frequent along the coast, but is very rare inland.

C. melanocéphalus.—Black, thorax rufous, antennæ and legs testaceous. 3–3½ : 1¼–1½.—*Car. melanoceph. Linn. Fab. Don.* xiv. pl. 480.

Head shining black, with two very faint frontal impressions; antennæ and palpi pale reddish: thorax shining red, with a yellowish tinge, the impressions very faint, the hinder angles somewhat obtuse: elytra very little wider than the base of the thorax, with five impunctate striæ and flat interstices, the 3d with two or three distant impressed points, and a row along the outer border: thorax red beneath, abdomen pitchy, the deflexed margin of the elytra and legs yellowish-red. Generally without wings.

This pretty insect is very common under stones in this neighbourhood and throughout the country. It is often observed in considerable numbers hybernating beneath stones, not unfrequently in company with some other common insects. Such as pass the winter in this state, are abroad very early in the spring.

B. *Thorax widest in front.*

C. píceus.—Pitchy-black, margins of the thorax, antennæ, and legs pitchy-red. 3½–5 : 1½–2.—*Steph. Illus.* i. 98. pl. 6. f. 3. *Car. rotundicollis, De Jean.*

Rather unlike the other species, owing to the different shape of the thorax and greater depression of the elytra: the colour deep pitchy-black, somewhat glossy; mouth, palpi, and antennæ pitchy-red: thorax somewhat convex, impunctate, narrowed behind, with a bent fovea on each side between the central line and the posterior angles; the latter rounded: elytra rather depressed, with impunctate striæ, the 3d with three or four large punctures, and a series along the margin: under side of the body, deflexed margin of the elytra and legs, pitchy-brown, the two latter often paler. This species is destitute of wings.

This insect has been found at Cramond, and in some other parts of the *Edinburgh* district, but it is scarce throughout the Lowlands of Scotland.

It occurs in some plenty in various parts of Forfarshire, Aberdeenshire, and Perthshire. In these counties another species of *Calathus* was taken abundantly last autumn by Mr Wilson, which perfectly corresponds to the *Harpalus micropterus* of Gyllenhal (vol. iv. 442), *Amara macrocephalus*, De Jean. It forms, therefore, an addition to the species hitherto recognised as British, and may be distinguished from the others by the following characters:—Shining black, antennæ, palpi, legs, and margin of the thorax testaceous, the thorax rather long, somewhat narrowest behind, with the hinder angles obtuse: elytra not much elongate, with slender impunctate striæ, the 2d and 3d from the suture with two impressed points.

GENUS—PRISTÓNYCHUS, *De Jean.* Named from *πρίστης a saw*, and *ὄνυξ, ὄνυχος, a claw*, because the claws are serrated beneath.—Antennæ filiform, 1st joint rather stout, 2d shortest, 3d longest, but not so long as the 4th and 5th united: palpi with the joints nearly of equal length, the terminal one oblong-ovate, truncated at the apex: mandibles curved, denticulated at the base: mentum with a bifid tooth in the centre: thorax contracted behind, elongate, more or less heart-shaped: three first joints of the anterior tarsi dilated in the males: claws with small teeth beneath, especially towards the base. —*De Jean. Spec. Gen.* iii. 43.

P. Terrícola.—Pitchy black, elytra punctate-striate, tinged with blue. 6–8: 2½–3½.—*De Jean. Car. Terricola, Oliv.* pl. 11. f. 124. *Car. subcyaneus, Illig. Gyllen.*

Head and thorax glossy black, with two impressions between the antennæ, the former slightly contracted behind, the latter depressed, with a line in the middle, a transverse impression before and behind, and a deep oblong fovea on each side near the basal angles: elytra oblong-ovate, slightly convex, with nine very faintly punctured striæ, and a short one on each side of the scutellum, some of them united at the apex and not reaching to the extremity, the 2d from the margin with a row of serrated points, and two or three punctures on the apex of the 3d: body beneath and legs brownish-black; mouth and palpi pitchy-red; antennæ brownish: claws denticulated at the base.

Found in moist places usually remote from light, not unfrequently in stables and outhouses, but it is far from common. It has occurred near Drumsheugh, and elsewhere.

GENUS—SYNÚCHUS, *Gyllenhal.*—Antennæ filiform, the 2d joint shortest, the 3d scarcely longer than the following: external palpi with the penultimate joint short, the terminal one thicker, cylindric, truncated at the apex; labial with the terminal joint large, dilated, and truncated obliquely; mentum with a bifid tooth in the centre: mandibles slightly bent and denticulated at the base: thorax nearly round, rather widest in front; elytra slightly convex, rounded behind: claws with small teeth beneath: three first joints of the anterior tarsi dilated in the males.

S. vivális.—Pitch-black, antennæ and legs rufous, elytra with impunctate striæ. 3–3½: 1¼–1½.—*Gyllen. Taphria vivalis, De Jean. Agonum vivale, Sturm.* v. 215.

Occurs very plentifully throughout the country. It is occasionally of a blue or violet colour, these varieties are sometimes met with by the sides of small streams and in marshy situations among the Pentland Hills.

A. víduum.—Black, obscurely greenish above, elytra deeply striated, with three impressed dots on the disk of each. 3¼–4 : 1½–2.—*Car. viduus, Illig. Har. viduus, Gyllen.*

Proportionably broader than any of the preceding, entirely deep black, the thorax and elytra somewhat tinged with green ; the former moderately convex, obsoletely wrinkled across, with a large smooth rounded fovea on each side between the dorsal channel and the hinder angles : elytra rather wide, somewhat convex and obliquely sinuated at the extremity ; the striæ deeply marked and very minutely punctured, the third interstice with three remote impressed dots, and the outer margin with a continuous row : under side and legs black.

In moist and marshy places, occasional. Hunter's Bog. Margin of Duddingston Loch.

A. móestum.—Deep black or bluish-black ; thorax and elytra rather wide, the latter deeply striated, with three impressed dots.

Very like the preceding species, of which it seems properly regarded by De Jean as a mere variety : the dimensions are nearly the same, but it is generally a little shorter and wider, of a uniform deep glossy black, not unfrequently tinged with blue ; the basal joint of the antennæ sometimes piceous : in other respects it presents no appreciable difference.

Not unfrequent in such places as the last : by the sides of rivulets among the Pentland Hills. Marshy fields near Muttonhole, &c.

A. pícipes.—Black, thorax oblong, somewhat narrowed behind, elytra and legs dull testaceous. 2¾–3 : 1–1¼.—*Car. picipes, Fab. Har. picipes, Gyllen.*

Head and thorax shining pitchy-black ; the former elongate, smooth, with an impression on each side in front ; palpi and antennæ pitchy-black : thorax a little wider than the head, scarcely broader than long, the sides very slightly rounded ; rather narrowed behind, the angles rounded obtusely ; the dorsal line and basal foveæ deeply impressed : elytra elongate, rather convex, obscurely testaceous, or blackish, delicately striated, the striæ impunctate, the interstices flat, the third usually with five large punctures, and a row on the outer margin : under side brownish-black ; legs dull testaceous.

Has been taken occasionally in this neighbourhood, but it is not very common.

GENUS—SPHÓDRUS, *Clair.*—Antennæ filiform, 1st joint stout, 2d short, clavate, 3d as long as the 4th and 5th united : external and labial palpi with the terminal joint oblong-ovate, truncate, shorter than the third : mandibles rather long, arched at the apex : mentum with a bifid tooth in the centre : head long, not contracted behind : thorax heart-shaped, truncate before and behind, all the angles acute : claws without teeth : anterior tarsi with four dilated joints in the male.

S. leucophthálmus. *—Pitchy-black, smooth, elytra oblong-ovate, very finely striate-punctate. 10–12 : 3½–4½.—*Steph. Car. leucoph. Linn. Car. planus, Fab. Sphodrus planus, Clairville.*

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* *The specific name of this insect may be regarded as a misnomer. The eyes are frequently white in museum specimens,* but they are never of that colour in the living state.

Head large, porrect, smooth, with two strongly impressed marks between the antennæ; palpi brown: thorax about as long as broad, narrowed behind, the sides widely margined; depressed above and faintly wrinkled across, with a transverse impression before and behind, a central line, and a wide fovea near each of the posterior angles: elytra oblong-ovate, the sides nearly parallel, rather dull black, with nine very faint punctured striæ, and a short one on each side of the scutellum, which are bounded at the base by a transverse line, and united in pairs at the apex; the 2d stria from the margin with a series of larger punctures: body beneath and legs brown-black, the hinder trochanters long and pointed.

In cellars and outhouses, sometimes under dead leaves in woods, but it is very scarce in Scotland. It is most abundant in the southern parts of Europe. This species exhibits an example, not very usual, of a *sexual* difference in the structure of the trochanter. In the male the posterior trochanter terminates in a long mucro or spine, while in the female it is rounded at the apex.

GENUS—ANCHÓMENUS, *Bonelli*.—Antennæ filiform, half the length of the body, 1st joint robust, 2d half the length of the third, which is scarcely longer than the following: external and labial palpi with the three last joints nearly of equal length, the terminal fusiform, slightly truncate: mentum with a simple tooth in the centre: thorax very little wider than the head in front, attenuated posteriorly and rather elongate: claws simple: anterior tarsi with the three first joints dilated in the males.

A. prásinus.—Head and thorax green, legs and elytra ferruginous, the latter with a large common bluish-black spot behind. 3–3½ : 1¼–1½.—*Car. prasinus, Fab. Panz. Faun. Germ.* xvi. f. 6. *Car. viridanus, Marsh.*

Head triangular in front, somewhat narrowed behind, green, rather shining; palpi and base of the antennæ testaceous, the rest of the latter dusky: thorax the colour of the head, with an arched impression across the front, a line down the middle, and a long, deep, somewhat bent, fovea on each side at the base: elytra double the breadth of the thorax, rather flat, pale ferruginous, with a large blue-black patch behind, sometimes running along the suture to the scutellum; having nine impunctate striæ on each, and a short one near the scutellum, the 3d interstice with four punctures, and a series on the margin: under side pitchy-black, faintly glossed with green; legs long, pale testaceous.

Not unfrequent beneath stones by road sides, in fields, &c. Duddingston, and road sides east from Duddingston. About Slateford, &c.

A. álbipes.—Shining pitchy-black, thorax punctured behind, antennæ, legs, and margin of the elytra pale. 3¼–3¾ : 1⅓–1⅔.—*Anch. pallipes, De Jean. Car. circulatus* and *dilutus, Marsh.*

Larger and more convex than the preceding; thorax wider and more heart-shaped, the hinder margin punctured: elytra somewhat convex, deeply striated, the third interstice with two punctures, and a row along the outer margin; the latter frequently pale, particularly the inflected portion: under side pitchy-black: palpi, antennæ, and legs, very pale yellowish.

Frequent under stones on the banks of rivers, and in moist places. Water of Leith, Esk, &c.—A pale ferruginous variety, occasioned probably by immaturity, occurs not unfrequently.

A. angusticóllis.—Deep shining black, thorax rather widely margined, elytra striated, the striæ indistinctly punctured in the bottom, the disk of each with three impressed points. 4½–5½ : 1¾–2.—*De Jean.* *Car. angusticollis, Fab.* *Platynus angusticollis, Bonelli.* *Steph.* &c.

Entirely deep shining black: head nearly smooth, faintly marked with two longitudinal impressions between the antennæ, the latter blackish, with the base of the lower joints somewhat ferruginous; palpi and mandibles reddish-brown: thorax scarcely so long in proportion to the size of the insect as in the preceding species, slightly convex in the middle, marked with tranverse undulating wrinkles, an arched impression across the front, and a longitudinal line in the centre, the sides rather widely margined, particularly at the hinder angles, which are acute and almost salient: elytra about twice the breadth of the thorax, widest beyond the middle, with nine striæ on each, and a short one next the scutellum, the striæ rather deep, and very slightly punctulated in the bottom, the interstices convex, the 3d with three impressed dots: under side and legs black, inclining to brown.

Rare in the southern division of Scotland, apparently more plentiful in the middle and northern districts. "Near Inveresk Church, a single specimen."—*Mr James Stark.*

We have sought for characters by which we might be authorised to retain this species in the genus *Platynus*, as originally proposed by Bonelli, but were unable to find any whereby it could be satisfactorily distinguished even as a subgenus, We have been compelled, therefore, to follow the Count De Jean in associating it with the *Anchomeni.*

GENUS—**CHLÁENIUS**, *Bonelli.*—Antennæ filiform, 1st joint robust, 2d minute, 3d as long as the 1st, the remainder of equal length, pubescent, terminal ovate: external and labial palpi with the penultimate joint long and clavate, the terminal one shorter, ovate-truncate: mandibles very slightly bent, acute, with four small teeth at the base: mentum with a notched tooth in the centre: thorax subquadrate, rounded on the sides: elytra slightly sinuated at the apex: anterior tarsi with the three first joints dilated in the males.—*Curtis, B. E.* ii. 83.

C. vestítus.—Brassy-green above, pubescent, elytra with a yellow margin, which is widened behind, antennæ and legs of the same colour. 4½–5 : 1¾–2¼.—*Car. vestitus, Fab.* *Marsh.* *Car. marginatus, Linn.*

Head nearly smooth, obsoletely wrinkled and impressed on each side anteriorly; palpi and antennæ pale yellow: thorax rather narrowest behind, pubescent and thickly punctured, the hinder angles acute; slightly convex, brassy-green, narrowly margined on the sides with yellow; the centre with the usual channel, and an impression on each side behind: elytra brassy-green, obscured by a dense, pale, depressed pubescence, with slightly punctured striæ and convex interstices which are closely granulated; the external margin bordered with yellow, the yellow portion widening towards the apex, where it becomes sinuated and dentate: under side pitchy-black, punctulated and pubescent; legs yellowish.

Inhabits marshy places and the banks of rivers and lakes, but is not common in Scotland. It is found plentifully in England, and on the Continent. Banks of the Water of Leith. Margin of Lochend.

C. nigricórnis.—Head smooth, thorax greenish-copper, punctate, the elytra green, finely granulated; legs and antennæ pitchy-black, the basal joint of the latter rufescent. 4½–5 : 2–2¼.—*Car. nigricornis, Fab.* *Marsh.*

Head bright green, slightly tinted with coppery; very minutely punctulated, the frontal marks rather obsolete, palpi and antennæ pitch black, the lowest joint of the latter reddish: thorax of equal breadth before and behind, the sides equally rounded and margined, thickly punctate and pubescent, and of a bright greenish copper colour; the impressions as in the preceding species: elytra green, covered with a yellowish pubescence, the spaces between the striæ finely granulated or chagrined: under side black, tinged with blue anteriorly: legs pitch black.

Found in such places as the preceding, and rather more frequently. Margin of Duddingston Loch, in the spring and autumn.

GENUS—LORÍCERA, *Latreille*. Perhaps from *λωρον*, *a thong*, and *κέρας*, *a horn*.—Antennæ subfiliform, 1st joint robust, almost as long as the three following united, 2d and 4th short with strong hairs, 3d nearly one-half longer than the 2d, and furnished with bristles beneath; 5th and 6th rather longer than the 4th, thickened at the apex, where there are a few hairs placed in a verticillate manner; the remainder subcylindric, pubescent (pl. 1. fig. 4.): external and labial palpi with the terminal joint ovate, somewhat cylindrical, truncated at the tip: thorax rounded: anterior tarsi with the three basal joints dilated in the male.

L. pilicórnis.—Brassy black, elytra punctate-striate, with three foveolæ on the disk of each, tibiæ and tarsi testaceous. 3–3½ : 1¼–1½.—*Car. pilicornis, Fab. Marsh. Don.* xi. pl. 367. f. 1. *L. ænea, Lat.*

Brassy-black, slightly greenish; head depressed, with two impressions anteriorly, a longitudinal line between the eyes, and a transverse one behind them, contracting the hinder part of the head into a distinct neck; antennæ bronzed black, the base of the lower joints rufescent; palpi brown: thorax rounded on the sides, the base straight and punctured, having a line down the centre, and a deep impression near each of the hinder angles: elytra scarcely tinged with green, closely punctate-striate, the third interstice with three large impressions, that nearest the apex rather remote from the others: beneath black; tibiæ, tarsi, and frequently the trochanters, yellowish-brown.

Very common under stones in summer, and in winter in decaying roots of trees and among moss. Abundant throughout Britain and all the north of Europe.

GENUS—BADÍSTER, *Clairville*.—Antennæ filiform, 1st joint longest, rather robust, 2d shortest, the remainder nearly of equal length: external palpi much elongated, basal joint minute, 2d long robust, 3d as long as the 2d, clavate, 4th elongate conic; labial one half shorter, the terminal joint robust, dilated, subovate: mentum without a central tooth: mandibles very obtuse and notched at the apex: head rounded: thorax widest in front, where it is widely emarginate, narrowed behind with rounded angles: elytra not sinuated at their extremity: anterior tarsi of the males with three dilated joints.—*Curtis, B. E.* iii. 139.

B. bipustulátus.—Black; thorax, legs, and elytra rufous, the latter with a large bent mark of black on each elytron, meeting at the apex. 2½–3 : 1–1¼.—*Car. bipustulatus, Fab. Marsh. Don.* xv. pl. 516.

Head shining black, with a transverse impression in front, and an elevated line before it; palpi pale ferruginous, the basal half of the terminal joint dusky; antennæ blackish, the lowest joint rufous: thorax smooth, rufous, wider than the head, with a line down the middle, and a rounded fovea on each side behind: elytra rufous at the base, with a large common bluish black mark at the apex, shaped like a horse shoe, leaving the external border, a round or triangular spot, common to both elytra, in the centre, and the margins of the suture, rufous; the striæ fine and impunctate, the 2d from the outer margin with a row of impressed points: thorax beneath and legs rufous, abdomen black.

Under stones, dead leaves, and decaying vegetables, not very unfrequent: King's Park. Road sides near Portobello. Fields about Duddingston, &c.—One of the species of the genus Trimorphus of Stephens, which connects Badister with Trechus, has been taken by Dr Leach at Loch Awe. It is the *T. confinis*, figured pl. ix, f. 5, vol. i. of *Steph. Illus.*

GENUS—TRÉCHUS, *Clairville.*—Antennæ filiform, the basal joint rather longest and somewhat robust, the last ovate and terminating in an obtuse point: external palpi with the penultimate joint obconic, the terminal one rather longer, conical, and pointed: mentum with an undivided acute tooth in the centre: thorax heart-shaped, truncate before and behind, the angles rather obtuse: body generally rather convex: the joints of the four anterior tarsi considerably dilated in the male.

T. dorsális.—Head and disk of the thorax black, elytra dull testaceous with a large oblong black mark on each, base of the antennæ and legs dull testaceous or brownish. 1⅔–2 : ⅔–¾.—*Car. dorsalis, Fab. Trech. dorsalis. Steph.* i. pl. 9, f. 1. *Acupalpus dorsalis, De Jean.*

Head black, smooth, with a small impressed point in the middle between the eyes, and an oblong mark anteriorly on each side; palpi testaceous, obscured with dusky; antennæ blackish, the lowest joint testaceous: thorax a little narrowed behind, the sides and posterior angles rounded, usually blackish in the middle, the sides more or less margined with testaceous; having a faint line down the centre, and an indistinctly punctured fovea on each side behind: elytra dull testaceous, with a large oblong patch on each, of a blackish-brown colour, sometimes tinted with blue, and variable in size, frequently covering greater part of the surface, but always leaving the sutural margin pale; the striæ impunctate, and the outer margin with a row of large impressions: under side brownish black; legs obscure testaceous.

This species is said to occur most commonly in the spring, at the roots of grass, and on gravelly banks by the sides of ponds. It inhabits the Pentland Hills, and some other places in the vicinity, but is not common.

T. suturális.—Pitchy black, with a reddish thorax, antennæ, sutural and external margins of the elytra yellowish, legs pale. 1¾–2 : ¾.—*Steph. Illus.* i. 168.

Head nearly as in the last: palpi pale testaceous; antennæ brownish at the tip: thorax not unfrequently yellowish or yellowish-red, with the posterior angles somewhat acute, having a rather deep line down the middle, and a slightly punctate fovea on each side: elytra pitchy black, the suture and outer margins yellowish, with rather deep impunctate striæ, and a row of impressed points on the external border: under side pitchy black; legs pale testaceous.

Likewise inhabits the Pentland Hills, but is far from plentiful.

T. fúlvus.—Rufo-testaceous, with the antennæ and legs pale, thorax with a punctate fovea on each side, elytra simply striated. 2–2½ : 1–1¼.—*Steph. Car. fulvus, Marsh. Acupalpus harpalinus, De Jean.*

Larger than either of the preceding, entirely of a shining rufo-testaceous colour, with the antennæ and legs pale, the elytra sometimes rather obscured; head smooth and glossy, with an impression on each side anteriorly; the eyes black: thorax with a deep central line, and on each side, at the base, a deep fovea, which is strongly punctured on the sides and bottom; the hinder angles scarcely rounded: elytra with simple striæ, the 2d from the margin with a series of large punctures at the base and apex, and the 3d interstice with a single impressed point near the 2d stria behind the middle.

Rather common under stones in fields, and on road-sides: road-sides near Duddingston, Craigmillar, Libberton, &c. Fields near Corstorphine.

T. minútus.—Shining pitchy black, antennæ and legs ferruginous, elytra chesnut colour, with four or five striæ towards the suture. 1½–1¾ : ¾.—*Car. minutus*, *Fab.* *Car. aquaticus*, *Marsh.*

Body considerably depressed; head with a deep arched impression over each eye; palpi pale testaceous, the antennæ ferruginous: thorax sometimes concolorous with the elytra, transverse, the sides rather rounded, and the hinder angles somewhat acute, with a deep dorsal channel, terminating anteriorly in a transverse arched line, and a small fovea on each side behind: elytra castaneous, or brown black, with four or five striæ towards the suture, which are usually smooth, but sometimes faintly punctured, the rest obsolete, the third stria frequently with two impressed dots, and the outer margin with a few large punctures at the base and apex: under side pitchy black; legs pale testaceous or ferruginous.

Pretty frequent, running about during spring and summer, on warm banks by road sides, and in sandy fields.—*Trechus fuscipennis* and *tristis* of Steph. Illus. are only slight varieties of *T. minutus*.

The above are the only species of *Trechi* that we have ascertained to inhabit Scotland, the *T. parvulus* of the Catalogue of Edinburgh insects published in the 6th vol. of the Transactions of the Wernerian Society, having been introduced by mistake.

Genus—BLÉMUS, *Ziegler.*—Antennæ rather long and robust, the 1st and 2d joints shortest, the former ovate, robust, the 3d and following joints nearly of equal length, the terminal one longest, elongate ovate: external palpi with the three last joints of equal length, the penultimate clavate, the terminal attenuated from the base to the apex, which is obtuse: terminal joint of the labial palpi likewise attenuated and obtuse: mandibles ciliated from the base to the centre, where there is a projecting tooth, the apex of which is bifid or trifid: thorax somewhat quadrate or heart-shaped, truncate before and behind, and not touching the elytra: body depressed: anterior tarsi of the males with the two basal joints dilated.—*Curtis*, *B. E.* vii. 310.

B. paludósus.—Head and thorax pitch black, elytra castaneous, punctate striate, antennæ and legs testaceous. 2½–3 : 1¼–1½.—*Bembidium paludosum*, *Gyllen.*

Head pitchy black, smooth, depressed in front, with a deep arched impression over each eye, but rather remote from it; mouth ferruginous, palpi and antennæ rather paler: thorax the colour of the head, smooth, short, rounded anteriorly, a little narrowed behind, the posterior margin straight, with acute elevated angles; having an arched impression in front, and another behind, terminating on each side in a deep fovea; the central channel strongly marked: elytra chesnut colour, frequently pale, with a bluish play of colour, punctate striate, rather strongly towards the suture, the third stria occasionally with two distant impressed dots, and three or four on the outer margin at the base: under side pitchy black, the hinder part of the abdomen ferruginous: legs pale testaceous.

Var. *b*. Head and thorax ferruginous, the former sometimes dusky, elytra pale, with a bluish play of colour, especially towards the apex.

Has been taken once or twice among the Pentland Hills, but it is very scarce, both in this neighbourhood, and throughout the south of Scotland. Taken in abundance by Mr Wilson, in a small wood, which borders the garden of Stewartfield, Dalguise, in Perthshire. It has likewise been captured by the Rev. W. F. Hope among the Grampians, and by Dr Fleming in Zetland.

FAMILY BEMBIDIIDÆ.

The insects first grouped together under the above name by Mr Stephens, are distinguished by the peculiar structure of the palpi; the penultimate joint being usually large and club-shaped, and the terminal one very short and slender (pl. 1. fig. 5.) Unlike the generality of the Harpalidæ, the species delight in moist gravelly or sandy soils, and are therefore found in greatest plenty on the banks of rivers, ponds, &c. Their bodies are in general depressed, and they are not unfrequently adorned with rather brilliant tints of green; the legs, however, are most commonly pale.

GENUS—CILLENUM, *Leach*.—Antennæ with the basal joint longest, rather robust, the three following somewhat obconic, the rest globose, the terminal one large and conical: external and labial palpi with the penultimate joint long and clavate, the terminal one very short and slender (pl. 1. fig. 5.): mandibles rather slender, with three teeth at the base: head large: thorax very little wider than the head, heart-shaped, truncate before and behind: elytra linear, depressed: three basal joints of the tarsi producing a strong spine at the internal angle.—*Curtis*, *B. E.* v. 200.

C. laterále.—Brassy green, the base of the antennæ and legs testaceous, elytra obscurely ochreous, punctate striate. 1¾-2 : ½-¾.—*Samouelle*. *Curtis*, *B. E.* v. pl. 200.

Head and thorax brassy green or cupreous, very minutely and obsoletely punctulated; the former with a shallow longitudinal impression on each side in front; palpi and antennæ testaceous, the latter rather dusky towards the tip: thorax in front very little wider than the head, narrowed behind, the sides margined, with a line down the centre, and an arched cross line anteriorly: elytra yellowish, glossed with brassy green in the middle, the striæ obscurely punctured, the third with four large dots on the sutural edge: under side bronzed: legs testaceous.

This insect was first discovered in Britain by Dr Leach, who found it on the sea-shore near Portobello: it has occurred since in considerable plenty on some parts of the eastern coasts of England, particularly those of Norfolk. It was probably never very abundant in the first mentioned locality, and is now become extremely scarce, but the occurrence of a few individuals in the early part of last summer, proves it still to inhabit the situation referred to. Figget Whins. May and June.

The curious little insect *Æpus fulvescens*, which bears some relation to

C. laterale, and is therefore placed next it in systematic arrangements, has been taken at Ballyhullish Ferry in Scotland.—*Curtis, B. E.* v. 203.

Genus—TÁCHYS, *Ziegler.* Named from ταχυς *swift.*—Antennæ filiform, the 2d and 4th joints of equal length, the two basal joints naked, the rest pubescent: external palpi with the 1st joint minute, 2d long, slightly clavate, 3d more robust, somewhat club-shaped, the terminal one very short and slender, with the apex acute: labial with the penultimate joint slightly clavate, the terminal much shorter and slender: mentum with an acute simple tooth in the centre: thorax with the sides equally rounded, the base as wide as the front: body convex: basal joint of the anterior tarsi dilated in the males.—*Steph. Illus.* ii. 4.

T. immúnis.—Brassy-black or violaceous, elytra without spots, obsoletely punctate-striate, legs pitchy-red. 1¼.—*Steph. Illus.* ii. 6.

Bronzed black or violet-colour, shining; head with a shallow curved impression over each eye; antennæ rufous at the base, the apex dusky: thorax smooth, somewhat convex, with a faint line down the centre, and a fovea on each side at the base: elytra of a uniform bluish-black, with the suture slightly rufescent, punctate-striate, the striæ becoming obsolete towards the outer margin: under side black; legs pitchy-red, the base of the thighs frequently more obscure.

Not unfrequent in dry sandy places in the spring.

T. binotatus and *T. obtusus* are the other Scotch species.

Subgenus—PHILÓCHTHUS, *Stephens.* Named from φιλος *a lover*, and οχθη *a bank.*—Antennæ with the 2d joint rather shorter than the 4th: thorax rounded anteriorly on the sides, the base a little narrower than the front: in other respects as in the preceding genus.

P. subfenestrátus.—Brassy-black, elytra punctate-striate, the apex smooth, with a small rounded testaceous spot; legs yellowish-red. 2–2¼ : ¾.—*Steph. Illus.* ii. 8.

Brassy-black, sometimes faintly tinged with green: head smooth, with a longitudinal impression on each side anteriorly; palpi and antennæ reddish, the upper part of the latter dusky: thorax smooth, the dorsal channel rather faintly impressed, and a depression on each side near the hinder margin: elytra very slightly convex, rather strongly punctate-striate, the striæ disappearing near the apex, which is smooth and glossy, with a small, round, testaceous spot on each elytron, towards the outer margin: under side pitchy-black; legs yellowish-red.

Has been taken occasionally near Edinburgh, but seems to be rather scarce in Scotland.

P. biguttátus.—Brassy-green, elytra punctate-striate, with two impressed points on the disk; a rounded spot on the apex, basal joint of the antennæ, and legs, rufo-testaceous. 1½–2 : ½–¾.—*Steph. Illus.* ii. 8. *Elap. biguttatus, Illig. Car. biguttatus, Fab.*

Head nearly as in the last, palpi and antennæ fuscous, the basal joint of the latter rufous: thorax with a dorsal channel, and a depression near the hinder angles: elytra punctate-striate, the striæ reaching to the extremity, but becoming rather faint, with a round yellowish spot near the apex of each elytron towards the outer margin, near which there is frequently a deep stria placed obliquely; the third interstice with two impressed dots: under side bronzed black: legs testaceous-red.

Under stones in fields, occasional. Fields west of Corstorphine, near Craiglockhart, &c.

P. gúttula.—Brassy-black, or greenish, elytra punctate-striate, a round apical spot and the legs rufescent; antennæ ferruginous, dusky towards the apex. 1½–1¾ : ½.—*Steph. Illus.* ii. 9. *El. guttula, Illig.* *Car. riparius, Oliv.*

Smaller than either of the preceding: head not unfrequently bluish, with an impression on each side in front, placed somewhat obliquely: thorax with a faint dorsal line, and an oblong oblique impression on each side at the base: elytra rather convex, punctate-striate, the striæ becoming obsolete towards the sides and apex; the latter with a pale reddish spot on each elytron near the outer margin: under side brassy-black: legs rufous, the thighs somewhat obscure.

Not very frequent, but has been taken at Cramond and some other places in the neighbourhood. It was observed by Dr Leach in the Isle of Arran, and we have received it from the north of Scotland.

GENUS—PÉRYPHUS, *Megerle.*—Antennæ filiform, the 3d joint longest, the remainder rather shorter, all the joints pubescent, except the two radical ones: maxillary palpi rather long, the external pair with the 1st joint minute, 2d and 3d nearly equal, the former somewhat clavate, the latter robust and clavate, terminal slender and acute: mandibles short and acute: thorax heart-shaped, truncate, the hinder angles acute and rather projecting: body very little convex: anterior tarsi with the two basal joints dilated in the males.

P. littorális.—Shining brassy-green, elytra with two pale oblique rufous spots on each, the striæ becoming obsolete towards the sides and apex; base of the antennæ and legs rufescent. 2½–3 : 1–1¼.—*Elaph. rupestris, Fab.* *Bemb. rupestre, Gyllen.* *Car. littoralis, Oliv.*

Head shining brassy-green, smooth, with a longitudinal impression on each side, and an elevated fold next the eyes; palpi and three basal joints of the antennæ ferruginous, the remaining joints dusky, most of them ferruginous at the base: thorax the colour of the head, margined on the sides, the disk moderately convex, smooth, with an arched impression across the front, a dorsal line, and a punctured fovea within each of the basal angles: elytra nearly flat above, rather deeply punctate-striate, the striæ becoming obsolete near the external margin and apex; the colour brown glossed with brassy-green, each elytron having two pale ferruginous spots, variable in size, one on the shoulder, the other towards the apex placed obliquely: under side blue-black; legs entirely pale ferruginous.

An exceedingly common insect in all parts of Scotland, under stones in moist places, by the sides of ponds, rivers, &c.

P. decórus.—Bright-green above, black beneath; base of the antennæ and legs ferruginous, elytra crenate-striate, the striæ disappearing at the apex, which is pale. 2¼–2¾ : ¾–1.—*Steph. Illus.* ii. 14. *Car. immunis, Marsh.*

Head with two deep frontal impressions; base of the palpi and of the antennæ ferruginous, the apex of both dusky: thorax glossy-green, with a narrow impression on each side behind, between the central channel and the basal angles: elytra depressed, bright-greenish, the apex pale ferruginous, punctate or somewhat crenate-striate, the striæ disappearing on the sides and apex, except that next the suture, which is prolonged to the extremity: under side bronzed black; legs ferruginous.

Not common; has been taken under sea-weed on the shore east of Portobello.

P. ágilis.—Bluish-black, tinged with green, basal joint of the antennæ and legs rufo-testaceous, elytra punctate-striate, the sides and apex rather smooth. 2¾ : 1¼.—*Steph. Illus.* ii. 15.

Brassy-green or bluish-black, tinted with green: head with a furrow over each eye; the lowest joint of the antennæ, and usually the base of some of the following, together with the palpi, testaceous; thorax with a deep channel down the centre, and a few transverse wrinkles, the hinder margin wrinkled longitudinally and impressed on each side: elytra depressed, punctate-striate, the striæ obsolete on the apex and external margin, the third interstice with two or three impressed dots: under side pitchy-black; legs pale reddish.

Under stones on the banks of rivers, and in moist sandy places not scarce. Banks of the Water of Leith, Esk, &c.

P. tibiális.—Brassy-black, the basal joint of the antennæ, tibiæ, and tarsi rufescent, elytra punctate-striate, the striæ extending to the apex. 2¾ : 1¼.—*Steph. Illus.* ii. 15.

Brassy-black, the head and thorax often bluish or greenish; the former with a furrow on each side; palpi and antennæ blackish, the lowest joint of the latter rufescent: thorax smooth and glossy, with a central line and a fovea on each side behind, both rather deeply impressed: elytra depressed, deeply striated, the striæ pretty distinctly punctured towards the base, the punctures somewhat obsolete near the sides and apex, the third with two or three dots, distant from each other: under side and thighs bronzed black; the coxæ, tibiæ, and tarsi rufescent.

In such places as the preceding, and of a similar degree of frequency.

P. Léachii.—Brassy-black, legs and antennæ black, the basal joint of the latter reddish beneath; elytra with impunctate striæ extending to the apex. 2½.—*Steph. Illus.* ii. 16.

Shining brassy-black; head tinted with violet, the frontal furrows rather shallow; palpi and antennæ black, the latter with the lowest joint reddish on the under side: thorax marked nearly as in the last: elytra tinged with green, the striæ narrow and without punctures, the third with two or three impressed dots: under side and legs black, the thighs sometimes reddish at the base.

This species appears to occur but sparingly: a few individuals have been captured near Cramond, but we are not aware that it has been observed elsewhere in this vicinity. It was found by Dr Leach near Loch Lomond.

In addition to the above, the following species occur in Scotland, viz.

P. nitídulus. Raehills.—*Rev. W. Little.*

P. femorátus. Banks of rivers and ponds in the central parts of Roxburghshire, not scarce.

P. viridi-áeneus. "Carfin, Lanarkshire."—*Rev. F. W. Hope. Steph. Illus.*

P. olíváceum. "Carfin, Lanarkshire."—*Rev. F. W. Hope. Steph. Illus.*

Of the genus Notaphus of Megerle, which comprehends a group of insects very closely related to the Peryphi, we are acquainted with only two species inhabiting Scotland. *N. obliquus* has been found in Dumfries-shire and others of the southern counties. *N. undulatus* occurs on the banks of the Teviot opposite Minto, likewise in Peebles-shire and near Annan.

GENUS—LÓPHA, *Megerle.*—Antennæ filiform, with the 3d and 5th joints of nearly equal length and rather longer than the others: external palpi rather short; 1st joint minute, 2d about the length of the 3d which is clavate, the terminal one very short and slightly truncate: labial with the penultimate joint strongly clavate, the last elongate and acute: thorax dilated before the middle, rather globose anteriorly, and much contracted behind: the 1st joint of the anterior tarsi dilated in the males.—*Steph. Illus.* ii. 21.

L. quadriguttáta. Dark brassy, tinged with green, elytra punctate-striate at the base, and having two pale spots on each. 2¼–2½.—*Car. 4-guttatus, Fab. Oliv.* t. 13. f. 160. *Marsh.*

Head rather large, greenish-blue, very smooth and glossy, with an oblong fovea on the inner side of each eye; palpi dull testaceous; the antennæ black, with the four lowest joints more or less ferruginous: thorax nearly one-half wider in front than behind, the surface anteriorly so convex as to appear somewhat globose, of a bluish-green colour, extremely smooth and glossy; the centre marked with a faint longitudinal line, the base rather depressed and slightly punctured, and each of the hinder angles with a small impression: elytra one-half wider than the base of the thorax, of a dark greenish-colour, highly polished, having a whitish spot behind the shoulder, and another towards the apex; the striæ composed of large and rather remote punctures at the base, but disappearing before they reach the middle, except the sutural one, which is prolonged to the apex: under side bluish-black: legs slender and of a pale colour.

This pretty insect is not common in any part of Scotland. We have taken it on the banks of the canal, and in a field to the west of the lodge at Pennycuik House. It frequents moist and marshy situations.

L. poécila. "Ben Lomond." *Dr Leach. Steph. Illus.*

GENUS—TACHÝPUS, *Megerle.* From *ταχυς swift,* and *πους the foot.*—Antennæ filiform, the 3d joint somewhat longest, the rest decreasing gradually in length to the apex: external palpi with the radical joint minute, 2d and 3d equal, the latter clavate, the terminal one very slender, short, truncate at the tip: mentum with an obtuse lobe in the centre: thorax heart-shaped, truncate, not very long, and applying closely to the base of the abdomen: the two basal joints of the anterior tarsi dilated in the males.

T. próperans.—Shining brassy, elytra punctate-striate, the striæ disappearing before the apex, antennæ blackish, legs pitchy-red. 1½–1¾.—*Steph. Car. rufipes, Marsh.*

Entirely brassy-black above, very glossy; head impressed on each side anteriorly, and having a somewhat crooked fold over each eye; antennæ blackish, sometimes obscurely ferruginous at the base: thorax rather convex, very smooth, with a faint line down the middle, and a transverse series of punctures along the hinder margin, terminating on each side in an impression near the angles; the latter acute: elytra moderately convex, punctate-striate, the striæ disappearing a little before the apex: under side shining black, legs pitchy-red.

Frequent on sand-banks, pathways, &c. during spring and summer. *T. celer* scarcely differs from the above, except in being smaller, seldom exceeding a line in length.

T. striátus.—Golden-brassy above, head and thorax punctured, elytra punctate-striate, with two impressed dots on the disk, legs brown.—*Steph. Bem. striatum, Sturm. D. F.* iv. 186, pl. 163. £ B. *b.*

Shining brassy above, inclining to golden, especially in the males; head rather thickly punctured, with two shallow impressions in front; palpi and antennæ black, the latter obscurely rufescent at the base: thorax thickly punctured, particularly on the sides and hinder margin, the angles deflexed and obtuse; the dorsal channel deeply marked, the base without foveæ: elytra broad, rather depressed, strongly punctate-striate, the sutural stria not reaching to the middle, the disk with two impressed dots: under side bluish-black, bronzed, the sides of the thorax punctured: legs brownish or piceous.

Occurs occasionally in this neighbourhood, and in other parts of the south of Scotland; but we never found it common, as it has been sometimes represented. Banks of the canal near Slateford. Craigleith. "Canonmills."—Dr Leach. *Steph. Illus.*

T. Ándreæ.—Greenish-coppery, antennæ, legs, and elytra whitish, the latter with a cross dentate brown band behind the middle. 2¼ : 1¼.—*Steph. Illus.* ii. pl. 10. £ 6. (*the transverse band not accurately represented*). *Car. Andreæ, Fab.*

Head greenish-copper, punctured thickly on each side, rather thinly in the middle, the space behind the eyes smooth; palpi and antennæ pale: thorax the colour of the head, smooth on the disk or transversely wrinkled, with a longitudinal line and a cross punctured impression behind: elytra short, broad, oval, moderately convex, smooth and shining, with regular punctate striæ which become faint near the apex; the colour whitish or yellowish-white, with the space round the scutellum, and a dentate band behind the middle crossing both elytra but not touching the margin, brown, glossed with metallic green: under side bluish-black; legs pale.

On the beach at Figget Whins under marine detritus, near high water mark. Although this place had been often examined previously, this insect was not observed till the early part of last summer, when it appeared in such profusion, that for a space of more than fifty yards, nearly a dozen of specimens might be taken from beneath every patch of sea-weed. It lurks in inequalities and small holes in the sand, sometimes considerably beneath the surface, and contracts its legs when disturbed. It is by no means very extensively, and rather locally distributed, appearing to be confined to the sea-coast.

The species of the genus *Bembidium*, from which this family derives its name, appear to be very scarce in Scotland. We have met with none of them near Edinburgh, but *B. flavipes* inhabits the banks of the Teviot opposite Minto, and those of the Tweed near Innerleithen in considerable numbers. The much rarer species *B. paludosum* was taken last autumn by Mr Little, by the side of Oxnam water, near Crailing Hall, in Roxburghshire.

FAMILY ELAPHRIDÆ.

GENUS—NOTIÓPHILUS, *Dumeril.* From νοτιος *humid*, and φιλος *a lover*, in allusion to the nature of the places which the species are accustomed to frequent. — Antennæ short, slightly thickened upwards, the basal joint somewhat robust: external palpi scarcely longer than the maxillæ, the 2d and 3d joints nearly of equal length, the terminal longest, fusiform, truncate; labial with the two last joints of equal length, the terminal thickish, ovate-truncate: head deeply furrowed between the eyes; the latter very large and moderately prominent: thorax nearly square, as wide as the head, the upper surface flat: elytra punctate-striate, with a broad, smooth, longitudinal space on each: anterior tarsi nearly alike in both sexes. —*Curtis, B. E.* vi. 254.

This genus was formed by Dumeril from the genus Elaphrus of Fabricius. It consists of a few small species, of very active habits, which conceal themselves beneath stones, vegetable remains, &c.

N. aquáticus.—Shining brassy-black, the disk of the thorax smooth, elytra with a single impressed dot on each, the striæ disappearing at the apex. 2½–2¾ : 1–1¼.—*Cicindela aquatica, Linn. Marsh.*

Shining brassy, inclining to coppery, sometimes violaceous and rather dull; head nearly as wide as the elytra, with about seven deep parallel furrows between the eyes; palpi and antennæ blackish; thorax a little narrowed behind, the sides margined, the front very slightly produced in the middle in the form of a triangle; the sides all round thickly punctured, the centre nearly smooth, with a short dorsal line and a fovea on each side behind: elytra with eight punctured striæ which disappear towards the apex, except the 1st and 7th; the 2d remote from the sutural one, leaving a broad polished space the whole length of the elytra between them, the others pretty closely placed at equal distances, the 2d from the outer margin somewhat obsolete; the 2d interstice from the polished space with a large puncture before the middle: under side of the body and legs bronzed black, the tibiæ sometimes rufescent in the middle.

Pretty frequent in sandy fields, on the gravelly banks of rivers, ponds, &c. The violet-coloured variety is not very common; it has been taken at Portobello, on Arthur's Seat, and some other places.

N. biguttátus.—Brilliant brassy, elytra with two impressed dots on each, the striæ reaching to the apex, which is of a pale yellow colour. 2–2½ : ¾–1.—*El. biguttatus* and *semipunctatus*, *Fab.*

Smaller than the last, more brilliant, and of a lighter copper-colour: thorax punctured throughout, or with a very small portion in the centre somewhat smooth: elytra with two very short oblique striæ at the base of the sutural one on its inner side, (in *N. aquaticus* there is only one); the striæ on the outer side of the smooth longitudinal space closely approximating and continued to the apex, which is of a straw-colour, and has an impressed dot, in addition to the one on the disk; the 8th stria rather obsolete, and the interstice on each side of it very glossy: base of the antennæ and middle of the tibiæ reddish-yellow, often obscure.

Rather more frequent than the last in this neighbourhood; and in the north of Scotland we observed it considerably more abundant. Like the preceding it is occasionally tinged with violet-blue. Among the Notiophili collected near Edinburgh, there is an individual with two distinct impressed dots on the disk of one of the elytra between the 3d and 4th striæ, and another at the apex; the other elytron having only a single discoidal impression, and another at the apex, corresponding to the specimen in the possession of T. C. Heysham, Esq., mentioned by Mr Stephens in the Appendix to his second volume, and described as the *N. quadripunctatus* of De Jean.

Not fewer than eighteen species of Notiophili have been recently described as inhabiting Britain. Of these the following have been found in Scotland:—*N. brevis*, *N. striatus*, *N. latus*, all of which have been taken near Inverness by H. Smith, Esq.*

Genus—ÉLAPHRUS, *Fabricius*.—Antennæ rather short and stout, slightly thickened towards the apex: external palpi longer than the maxillæ, the 1st and 3d joints short, the 2d and 4th longer and more robust, the latter truncate; labial, with the two last joints of nearly equal length, subclavate, the terminal truncate: eyes large and very prominent: thorax about the breadth of the head, subcylindrical, contracted before and behind: elytra much wider than the head and thorax, with large rounded impressions, having an elevated point in the centre: anterior tarsi of the males with four of the joints slightly dilated.—*Curtis*, *B. E.* iv. 179.

This genus was separated with great propriety by Fabricius, from Cicindela of Linnæus. It is constituted by a few small species, most of which are remarkable for their metallic lustre. They are extremely active in their movements, and though now disjoined *longo intervallo* from their former companions, they present many points in common with the Cicindelæ. They differ, however, in this, that whereas the latter affect dry and sunny situations, the subjects of our present genus are always found in moist places. Fabricius, indeed, derived their name from Ελος *a marsh*, although it may also be plausibly traced to Ελαφρος, *light*, *active*, as a stag. These insects are carnivorous, and prey chiefly upon small aquatic larvæ, on which account they are frequent on the sides of waters. One species, indeed, is said to run on the surface of that element †. We know little of their larva state.

The Elaphri are most prevalent in the northern parts of Europe, the more common species becoming rather scarce in the south, and two or three not extending farther than the northern extremity of Germany. The genus is by no means numerous in species, all of which bear a very close resemblance to each other, and appear to be confined to Europe, with the exception of *E. riparius*, a variety of which, or a closely allied species, has been found in North America.

E. cúpreus.—Dark brassy, inclining to copper-colour, thorax as wide as the head, the latter foveolated; tibiæ testaceous, with the apex and the tarsi steel-blue. 3½–4: 1½–1¾.—*Megerle. Steph. E. uliginosus*, *Gyllen.*

Dark brassy or cupreous, slightly tinged with green in some places: head thickly punctured, with an impression on each side of the vertex, and a small foveola in the centre; the two anterior impressions obsolete; palpi, mandibles, and antennæ blackish, the four lowest joints of the latter greenish-bronze: thorax a little narrower in front than the head, widened in the middle, and again contracted at the base, the sides narrowly margined, the upper surface convex and thickly punctured, with a very short and deeply impressed dorsal line, which is forked anteriorly, a fovea within each of the hinder angles, and a small rounded impression on each side near the middle, often very indistinct: elytra punctulated, each with four rows of large round spots, the centre of which is punctured and of a violet-colour, and the outer margin raised and somewhat smooth, the spaces between the spots elevated and very glossy, particularly towards the suture: under side of the body brassy-green; thighs the same colour, somewhat testaceous at the base; tibiæ testaceous, the apex, together with the tarsi, steel-blue.

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* *Entomological Mag.* No. ii. 202.

† *Olivier*, ii. No. 34. p. 2.

"Found on the borders of lakes and ponds, from April to August. It runs upon the mud when the sun shines, with great rapidity, and is difficult to capture."—*Curtis.* Margin of Duddingston Loch, Lochend, and numerous other places, rather frequent. "Glen Clova."—*Hewett C. Watson, Esq.* and *Captain Graham.*

E. ripárius.—Brassy green, thorax about the width of the head, the latter without foveolæ; tibiæ testaceous, with the apex and the tarsi bronzed green. 3–3½ : 1¼–1½.—*Steph. De Jean. Cicind. riparia, Linn. Marsh. Don.* ix. pl. 301.

Brassy-green, with coppery reflections: head very thickly punctate, without impressions; palpi and four lowest joints of the antennæ greenish bronze: thorax thickly punctate, marked as in the last species, but much more faintly: elytra more rounded at the apex than in *E. cupreus*, very thickly punctulated, each with four rows of rounded spots, rather faintly marked, which have their centre purplish and margin brassy; the intermediate spaces obsoletely elevated, except one before the middle of the sutural row, which is large, quadrate, and very glossy; some of the others on the same row are often slightly polished: under side and legs bronzed green; base of the thighs and tibiæ (except the apex) pale testaceous.

In such situations as the last, but scarcely so frequent. Sea-shore between Leith and Portobello on the moist sand, very plentiful. April—August *.

GENUS—**BLÉTHISA**, *Bon.*—Antennæ very slightly thickened towards the apex, with the 2d and terminal joints longest, the former clavate, the latter conical: external palpi with the two last joints of equal length, the 2d longest and robust; labial, with the terminal joint truncate, scarcely so long as the preceding, which is clavate: thorax wider than the head, nearly square, the sides somewhat rounded: anterior tarsi of the males with the joints scarcely dilated.—*Curtis, B E.* vii.. 326.

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* The entomological productions of Scotland bear a more obvious resemblance to those of Sweden, than to those of any other portion of the European continent. A general similarity is of course to be expected as the natural result of the two countries occupying a similar latitudinal position, and not being very widely distant from each other. They possess, however, other attributes in common, which make the agreement closer than these circumstances of themselves are likely to produce. Most of the recent additions to our Scottish coleoptera are species previously known as inhabitants of Sweden, such as *Clivina arctica, Calathus micropterus, Byrrhus æneus, Salpingus foveolatus,* &c. To these we are enabled to add the *Elaphrus Lapponicus,* which was taken by Mr Lyell, in June 1831, on the north-west side of Catlaw, a mountain in Forfarshire, on a spot nearly 2000 feet above the level of the sea. It is described by Mr Curtis in the first Number of the Entomological Magazine, along with another species from the same locality, *Elaph. splendidus,* which, however, is conjectured to be one of the sexes of *E. Lapponicus.* The following characters will suffice to distinguish the latter from its associates:—Oblong, rather narrow, of a brilliant greenish bronze, tinged with copper colour: head and thorax deeply and closely punctured, the latter with a short and shallow furrow, bifid at both ends: elytra rather narrow, the apex of each rounded, the upper surface sparingly punctured and adorned with four rows of small foveæ of a dull lilac colour, so faintly impressed as to appear obsolete, and not surrounded with a ring, the spaces between the foveæ scarcely elevated: thighs shining coppery red, tibiæ and tarsi greenish-bronze: antennæ steel-blue, the four lowest joints greenish-bronze. 4–4½.

B. multipunctáta.—Dark brassy, the margin greenish, elytra irregularly punctate-striate, with two series of large foveæ on each. 5–6 : 2–2¾. —*De Jean. Car. multipunctatus, Linn.*

Usually dark brassy above, with the borders of the thorax and of the elytra bright coppery-green; head with a deep flexuose line on the inner side of each eye, and a transverse one behind the eyes, where there are a few large punctures; palpi black; antennæ brownish, the basal joint bronzed-green, the three following blue-black: thorax punctured on the margin, the disk nearly smooth, with a transverse impression in front, which forms an angle with the central channel, and a deep excavation on each side behind: elytra with six irregular striæ impressed with small points of a brilliant green, and two series of large impressions, the bottom of which is likewise green; the external margin with scattered dots: under side coppery; legs black, reflecting metallic green.

Inhabits the borders of Duddingston Loch, but is very scarce. We are not acquainted with any other Scotch locality.

SUBSECTION—HYDRADEPHAGA.

FAMILY DYTISCIDÆ.

THE genus Dytiscus of Linnæus embraced a vast assemblage of aquatic insects, which the more minute observance of modern times has partitioned into many genera. The Dytiscidæ are a truly amphibious family, for although water is their favourite element, they survive for a long time on moist land, and most of them fly about in the evening and morning twilight, and even during the darkness of the dewy night, with great power and celerity. They vary greatly in size according to the species, some being no larger than a flea, while others measure between one and two inches in length. They are fierce and voracious in their habits, preying indiscriminately upon whatever smaller and softer tribes they are able to subdue. They are widely distributed, and inhabit rivers, lakes, marshes, ponds, and ditches, wherever these are to be found, from Greenland to Van Diemen's Land. They are frequently observed resting on the surface of the water, with their legs expanded, their heads downwards, and the terminal segment of their bodies in contact with the air. It is thus that they carry on the process of breathing, for they cannot respire except by bringing a globule of atmospheric air in contact with the stigmata, which are placed on the sides of the abdomen just beneath the outer margins of the elytra. Being specifically lighter than water, when they feel the necessity of respiration, they have nothing to do but to allow themselves to float to the surface, where, by a peculiar action of the tips of the elytra and the terminal segment of the body, a portion of air is brought into contact with the stigmatic openings. The bodies of the larvæ of these insects, consist of eleven well defined segments. The head is large, flattish, covered above by a scale marked down the centre by a longitudinal furrow. On each side there are five or six black tubercles, which are regarded as eyes, and anterior to the eyes are placed the antennæ, consisting of three articulations. The mouth is armed with a pair of strong, horny, curved, sharp pointed mandibles, which serve to seize and transfix the prey. According to Swammerdam and De Geer, these organs are pierced so as to act as suckers, by means of which the animal juices are absorbed. Near the extremity of the abdomen two delicate appendices may be perceived, pointing obliquely downwards. By means of these the larva appears to suspend itself occasionally from the surface of the water when it wishes to respire. The principal stigmatic openings are at the end of the abdomen, and consist of two small cylindrical bodies, which, when the animal floats, come in contact with the air, and communicate with the tracheal vessels which are seen to traverse beneath the skin, on either side of the body. The movements of these insects in the larva state, are affected in the water, partly by the legs, and partly by an undulatory motion of the tail. They prey upon other larvæ, such as those of dragon flies, ephemeræ, gnats, &c. As an instance of their great voracity it may be mentioned, that we once observed one of the larger kinds transfix and suck out the juices of thirteen well grown tadpoles in a single day. When the period of their transformation has arrived, they leave the water and bury themselves in the moist soft earth of a neighbouring bank. There they work for themselves an egg-shaped chamber, in which they assume the nympha state. How long they remain in that condition is not very precisely known, from the difficulty of rearing them in confinement throughout their entire change; but it is believed that the insect is not long of making its appearance in the perfect state. It may then be kept alive in a tumbler for several seasons, and the larger kinds (*Dytisci* proper,) soon assume a certain degree of tameness and familiarity, will follow the finger around the wall of their transparent prison, and coming to the surface at an accustomed signal, will demand, according to their own mode of expression, a young earth-worm, or a piece of fresh beef or mutton; for on these and several other articles, they feed from the first with extreme, and, as it were, accustomed greediness *. They may thus be said to be aquatic in the larva state, terrestrial in that of nymph, and amphibious in their winged condition.

GENUS—HALÍPLUS, *Latreille.* From αλς, *the sea*, and τλοος, *sailing.*—Antennæ short, filiform: external and labial palpi with the two basal joints minute, 3d long and clavate, terminal short, slender, conic: mandibles with a piece cut out at the apex: head porrect, oval, rather elongate: thorax narrowed in front, the base with a projecting angle in the middle, occupying the place of the scutellum which is wanting: body convex, slightly attenuated to the apex, which is rather obliquely truncate: legs long and slender, formed for walking, the hinder thighs nearly covered with a broad plate or lamina; tarsi 5-jointed, each terminating in two claws.—*Lat. Gen. Crust.* ii. 234. *Steph. Illus.* ii. 38.

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* Esper kept a living specimen of *Dytiscus marginalis* in a glass vessel for three years and a half. It fed on beef.

H. elevátus.—Oblong-ovate, pale testaceous, elytra with black lines, and an elevated ridge on each. 1¾–2.—*Gyllen. Dytis. elevatus, Marsh.*

Rather more elongate than the following species; head deep testaceous, punctulated and glossy; palpi and antennæ wholly pale: thorax likewise pale ferruginous, glossy, and covered with very minute punctures; the basal margin sinuated and produced in the shape of a triangle in the middle; the front narrow and slightly emarginate: elytra wide near the base, and narrowed to the apex, of a pale ferruginous colour, with eight entire and two abbreviated striæ on each, all of them deeply punctured and dusky, except the two next the outer margin; the 3d interstice from the suture with an elevated ridge reaching from the base to the middle: under side deep testaceous, punctured; legs elongate and of a pale hue.

Rare in Scotland. Water of Leith above Coltbridge.—*Mr G. Little.*

H. ferrugíneus.—Ovate, shining ferruginous, elytra deeply striate-punctate, the interstices with a series of smaller punctures. 1¾–2 : 1–1¼. —*Gyllen. Dytis. ferrugineus, Linn.*

Larger than either of the following: head glossy, convex, punctulated; eyes black; palpi and antennæ pale: thorax much narrowed in front, with the angles deflexed on each side of the head, and somewhat acuminated, the sides oblique, nearly straight, and very narrowly margined; the sides all round thickly punctured, and the base with a transverse row of large punctures parallel with the hinder margin: elytra widest just behind the base, the apex obliquely truncate, and somewhat acuminate, each with ten regular striæ, composed of large round punctures, the interstices with a series of smaller punctures rather remote from each other, except those next the suture which form a regular stria: under side and legs also ferruginous, the femoral plate paler and rather deeply punctate.

Var. *b.* The striæ and irregular patches on the elytra dusky black.

In still waters, occasional. Braid Hill marshes. Ditches at Muttonhole, &c. Var. *b.* has been taken in Duddingston Loch.

H. lineáto-cóllis.—Pale ferruginous, the anterior margin of the thorax and a line down the centre black. 1¼–1½.—*Gyllen. Dytis. lineato-cóllis, Marsh.*

Head punctulated, usually dusky black behind, the antennæ and palpi pale: thorax shaped as in the preceding, punctulate, ferruginous, with the anterior margin and a line down the middle blackish; the base with two short curved lines, one on each side, turned obliquely forwards, and rather dusky in the bottom, and a transverse impression between them: elytra with striæ composed of large dusky punctures, the 4th and 5th with a few large oblique impressions at their base, the interstices having a few minute scattered dots, and a continuous row next the suture; the disk with a few obsolete brown spots: under side ferruginous, legs paler.

A common inhabitant of the ponds in the neighbourhood, most plentiful during the spring months. Considerable numbers may sometimes be found together, adhering to the under surface of floating leaves, wood, &c., not unfrequently in company with Hydropori.

H. ruficóllis.—Rufo-testaceous, the thorax unspotted, with two curved striolæ behind, elytra punctate-striate, the interstices punctulated and spotted with fuscous. 1⅜.—*Samou. Steph. Dytis. ruficollis, Marsh.*

Head and thorax similar to the last, but the thorax is entirely testaceous red, the disk nearly smooth, the sides punctured: elytra with dusky punctured striæ, the interstices with dusky spots and small scattered punctures, which approximate on the sutural interstice, and form a continuous row: under side and legs pale testaceous, the plate over the hinder thighs strongly punctured.

In such places as the two preceding species, not scarce. Duddingston Loch, and ditches in the neighbourhood.

Genus—**PAELÓBIUS**, *Schoenherr*.—Antennæ not longer than the thorax, with the radical joint long and stout, the 2d short, nearly globose, the following rather long and nearly equal, terminal acute: external palpi with the two lowest joints short, 3d long and clavate, with a projection on its inner side, the 4th slightly clavate: mandibles with two large teeth at the apex: head ovate, the eyes prominent: scutellum obvious: body considerably convex, not acuminated behind, but obtusely rounded: legs formed for walking, the hinder thighs not covered with a plate, the four anterior tarsi a little dilated in the males; all the legs terminating in two claws.

P. Hermánni.—Black, with the head, a band across the thorax, the base and margin of the elytra and legs ferruginous. 4¾–5¼.—*Samou. Comp.* pl. 3. f. 14. *Dytis. Hermanni, Fab. Marsh. Don.* xiv. pl. 501. f. 2.

Head, palpi, and antennæ ferruginous; the region of the eyes, and sometimes the forehead, blackish: thorax black before and behind, a narrow space across the middle being ferruginous: elytra wider at the base than the thorax, convex, obtusely rounded behind, the surface rugose and marked with a few smooth lines running somewhat obliquely to the apex, the disk of a black colour, the base and sides more or less ferruginous: under side of the latter colour, the apex of the abdomen dusky: legs ferruginous.

Very scarce. Pond at Coates.—*Sir P. Walker.*

Genus—**HYPHÍDRUS**, *Illiger*. From *ὕφυδριος, living under water*.—Antennæ rather short, the two lowest joints larger than the others, the 4th shortest: external palpi with the 3d joint short and cylindrical, the 4th long and conical; mandibles with a piece cut out of the apex: scutellum awanting, its place occupied by a small triangular projection from the thorax: body very thick and convex: legs formed for swimming, the four anterior tarsi consisting each of four joints, the last of which is short and terminating in two claws, the posterior pair five-jointed, and having only a single claw on each.

H. ovátus.—Ovate, ferruginous, finely punctured, elytra rusty-brown, with a silky gloss. 2–2¼.—*Dytis. ovatus, Linn. Hydrachna gibba, Fab. Hyph. gibbus, Gyllen.*

Short, ovate, and very thick, owing to the convexity of the under side of the body: head and thorax ferruginous red, minutely punctured; the latter short and transverse, much narrowed in front, where it is emarginate, the basal margin sinuated and produced in a triangular form in the centre; the surface scarcely convex, and marked with a few large punctures in the middle near the base: elytra large, much dilated behind the shoulders, and attenuated to the apex, the back depressed; of a ferruginous brown colour, with a pale margin, and slightly sericeous: under side gibbous, ferruginous, the breast more deeply punctured than the other parts: legs ferruginous, the antennæ of a paler hue.

Not common, but has been met with occasionally in the lochs and ponds in this vicinity. Pond, Coates. Lochend.

GENUS—**HÝGROTUS**, *Steph.* From *υγϱοτης humidity*, in allusion to their place of abode.—Antennæ with the two lowest joints rather long, the 3d and 4th very stout and of equal length, the remainder rather increasing in length and thickness to the terminal one, which is longest: external palpi with the terminal joint thick at the base, somewhat conic, acute: mandibles with a piece cut out at the apex: scutellum awanting: body very thick, nearly globose: the four anterior tarsi four-jointed, the hinder pair five-jointed; all of them terminating in two claws.—*Steph. Illus.* ii. 46.

H. reticulátus.—Ferruginous, elytra finely punctured, black on the disk, with interrupted ferruginous lines. 1¼–1½.—*Dytis. reticulatus, Fab.*

Head minutely punctured, and having a large fovea on each side of the forehead: antennæ pale ferruginous, the apex somewhat dusky: thorax very short and transverse, much narrowed in front, moderately convex above, finely punctured and of a ferruginous colour, the hinder margin black in the middle: elytra large, ovate, rather acuminated, convex, marked with a few irregular large impressions and numerous minute punctures; black, with the outer margin, a spot near the base, and several abbreviated lines on the disk, rather obsolete, except towards the apex, pale ferruginous: under side and legs of the same colour.

Common in clear stagnant waters, especially in the spring.

H. píctus.—Ferruginous, elytra pale with an oblong spot on the disk, the suture and a stria near the margin black. ¾–1.—*Dytis. pictus, Fab. Dytis. flexuosus, Marsh.*

Considerably less than the preceding, broad and convex: head large and rounded, ferruginous, somewhat dusky about the region of the eyes, and having a small impression on each side: thorax and elytra with a few scattered minute hairs; the former pitch-black on the disk and shining, the sides ferruginous, and impressed within the margin with a short line; the latter very convex and thickly punctulated, pale yellow, with the suture, a large spot on each shoulder, an oblique stria within the margin, and a large oblong-ovate spot in the middle, black: under side ferruginous and punctured; legs rusty-red.

Not of frequent occurrence. Muttonhole and elsewhere.

The following are Scoth species:—

H. scítulus (*Steph. Illus.* pl. xi. f. 3.)—In Aberdeenshire, occasional.

H. cónfluens.—Raehills.

H. collháris.—In stagnant waters throughout Roxburghshire, not unfrequent.

H. inæquális.—Dumfries-shire.

GENUS—**HYDRÓPORUS**, *Clairv.* From *υδωϱ*, *water*, and *ποϱος*, *passage*.—Antennæ longer than the thorax, filiform, the two basal joints rather longest, the remainder nearly equal in length, somewhat clavate, terminal elongate-ovate: external and labial palpi with the terminal joint elongate-ovate, truncate: mandibles truncated at the apex, and having a minute tooth near the middle: head rounded; eyes small and remote: thorax transverse, broadest behind: scutellum wanting: elytra oval, depressed, the apex pointed: 4 anterior tarsi 4-jointed, the hinder pair 5-jointed *; all of them with two claws.—*Curtis, B. E.* viii. 343.

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* This structure of the tarsi in the above defined genus is somewhat remarkable. The number of the joints of these parts in the different legs is expressible by 4 : 4 : 5, while in almost all the other coleopterous heteromera the numbers are 5 : 5 : 4.

H. depréssus.—Oblong-ovate, rather depressed, ferruginous, thorax with two black spots in the middle behind, elytra black, with spots and irregular lines of a pale colour. 1¾–2: 1–1¼.—*Dytis. depressus, Fab. Dytis. elegans, Marsh.*

Finely punctulated, and slightly pubescent; head ferruginous, palpi and antennæ paler, the apex of both somewhat dusky: thorax with the sides rounded and narrowly margined, the base produced in the middle in place of the scutellum, the colour similar to that of the head, with the front and base blackish, the latter having two large rounded or angular black spots in the middle, which are united at the base: elytra obliquely subtruncate at the apex, with an acute tooth on each side, rather convex above, black on the disk, with irregular pale lines, a large pale spot anteriorly, and another towards the middle, the outer margin with four pale spots, which are united externally, and render the entire margin pale: under side and legs ferruginous, the former sometimes dusky.

In shallow pools by the side of the Water of Leith, Esk, Almond, &c., not unfrequent. April–September.

H. alpínus.—Ovate, pale above, black beneath, the thorax with two transverse abbreviated black lines interrupted in the middle, and bounded on each side by a longitudinal curved impression. 1½–1¾.— *Steph. Illus.* ii. 54, pl. xi. f. 5.

Smooth, rather shining: head straw-colour, the vertex rufescent; antennæ and palpi pale; the terminal joints tipped with black: thorax pale ferruginous, with two short transverse lines of black interrupted in the middle, and a bent striolet on each side behind, at a little distance from the lateral margin, and parallel with it; the front is likewise margined with black, and the surface minutely punctulated: elytra rather closely punctulated, straw-colour, with close black lines, which are more or less interrupted externally, leaving two or three yellowish spots on the side, and another on the shoulder: under side black; legs ferruginous, the tarsal joints in the hinder pair tipped with black.

We have taken this species in considerable numbers beneath stones in pools, by the side of the Water of Leith above Coltbridge. It is frequent in similar situations on the banks of the Tweed and Teviot.

H. triviális.—Ovate, somewhat convex, shining black, very slightly pubescent, the hinder margin of the thorax and the elytra thickly punctulated, legs piceous. 1½–1¾.—*Spence. Steph.*

Head pitchy-black, with two small impressions in front; antennæ and palpi pitchy-red at the base, the apex blackish: thorax nearly smooth in the centre, the sides and hinder margin thickly punctured: elytra moderately convex, the whole surface thickly covered with pretty large punctures, the apex somewhat acute: under side black, punctulated; legs pitchy-red.

Only a few individuals of this species have occurred near Edinburgh. They were taken in the Braid Hill marshes.

H. melanocéphalus.—Oblong-ovate, somewhat convex, shining black, glabrous, the base of the antennæ ferruginous, legs piceous. 1¾.—*Hyph. melanocephalus, Gyllen. Dytis. melanoceph. Marsh.*

Nearly glabrous, the pubescence being so short and thinly scattered as to be scarcely perceptible, the surface entirely covered with very minute closely placed punctures: head obtusely rounded, black, the crown reddish; antennæ ferruginous at the base, the rest black: thorax short, transversely convex, black, punctured throughout: elytra likewise shining black and punctured, very little dilated in the middle, the apex rather rounded: under side shining black: legs pitchy-black, frequently paler.

Var. *b.* Elytra and legs pitchy-red.

In ditches and shallow pools not unfrequent. The variety is not rare. Ditches at the east end of Duddingston Loch, &c.

H. erythrocéphalus.—Oblong-ovate, black, pubescent, head and legs rufous, margins of the thorax and elytra obscurely ferruginous. 1¾.—*Hyph. erythrocephalus, Gyllen. Dytis. erythro. Linn.*

More convex than the preceding, finely and thickly punctulated and covered with depressed cinereous pubescence: head rufescent, with a dark spot between the eyes, sometimes interrupted in the middle; antennæ dusky, the base testaceous: thorax with the sides ferruginous, the disk black: elytra moderately convex, rather obscure black, the shoulders and outer margins obscurely ferruginous: under side shining black; legs rufo-ferruginous.

In such places as the preceding, rather frequent.

H. flávipes.—Somewhat depressed, black, pubescent, elytra fuscous, with the base and margin testaceous, legs and base of the antennæ ferruginous. 1½–1¾.—*Dytis. flavipes, Fab. Dytis. humeralis, Marsh.*

Subdepressed, the surface closely punctulated and thinly pubescent: head with an impression on each side in front, the crown ferruginous; antennæ dusky upwards, the base ferruginous: thorax short, slightly convex: elytra rather wide, ovate, fuscous, the base and sides testaceous: under side shining black: legs ferruginous.

Pretty frequent in stagnant water. Ditches at Muttonhole and at Duddingston, &c.

H. holoseríceus.—Somewhat depressed, black, pubescent, base of the antennæ and legs ferruginous. 1¾–2.—*Dytis. holosericeus, Marsh.*

Considerably depressed, black, punctulated, and pubescent: head ferruginous on the crown; antennæ dusky, ferruginous at the base: thorax entirely black: elytra covered with thick pubescence, black, the base and lateral margins somewhat testaceous: under side shining black, punctulated and subpubescent; legs ferruginous.

May be found in company with the other species not unfrequently.

H. pubéscens.—Flat above, black, pubescent, elytra with a punctured stria on the disk. 2.—*Hyph. pubescens Gyllen.*

Nearly flat, rather wide, thickly punctured, and clothed with griseous pubescence: head black, the crown ferruginous; antennæ as in the last: thorax black, with a very shallow transverse impression before and another behind: elytra large, obtusely rounded at the apex, of a deep testaceous colour, very thickly punctulated, with long pubescence and a rather obsoletely punctured stria on the disk of each: under side shining pitchy-black, punctured: legs ferruginous, the thighs often obscure in the middle.

Frequent in Braid marshes and other places.

H. fuscatus has recently occurred in Dumfries-shire.

GENUS—**LACCÓPHILUS**, *Leach.* From *λακκος a lake,* and *φιλος a lover.*

Antennæ filiform, rather slender: external palpi with the last joint longer than the preceding and awl-shaped: labial with the terminal joint likewise longer than the others and narrowed to a point: mandibles acute, with a few inconspicuous teeth towards the tip: thorax short and transverse, with a triangular projection in the middle behind, instead of a scutellum : the hinder legs much compressed, ciliated, and formed for swimming; all the tarsi consisting of five joints.—*Zool. Mis.* vol. iii. 69.

L. minútus.—Oval, ferruginous-yellow, elytra dusky greenish-yellow, the base and sides paler. 1¾–2¼.—*Dytis. minutus*, *Fab.* *Gyllen.*

The general form very like the species of the following genus, from which, however, the want of a scutellum obviously distinguishes it : colour dull yellowish, very slightly tinged with green ; head convex, smooth, and shining ; eyes black ; antennæ and palpi pale : thorax sinuated behind, with an angular projection in the middle, the surface moderately convex, greenish-yellow without spots : elytra attenuated to the apex, which is itself obtuse, pretty convex in front, rather depressed behind, very smooth and glossy, the colour similar to that of the thorax, but duller and more dusky, with some pale spots on the lateral and basal margins, an oblique streak behind the shoulder and another in the middle, an oblong one behind the middle near the margin, and another at the apex : under side and legs testaceous-yellow, the hinder tarsi somewhat dusky.

In ponds and other collections of water, but apparently nowhere very common. Duddingston. Only one other British species belongs to the genus, *L. interruptus*, which has been recently taken in the south of Scotland. It is conjectured to be a mere variety of *L. minutus.*

GENUS—COLYMBÉTES, *Clairville.* From the Greek word *κολυμβαω*, *to swim.*—Antennæ subsetaceous, 2d joint short, the rest of equal length, terminal somewhat obliquely truncated at the apex : external palpi with the basal joint small, 2d and 3d of equal length, 4th longer, truncated ; labial rather long and robust, 1st joint half the length of the 2d, which is as long as the 3d, the latter slightly curved and truncated obliquely : mandibles short and obtuse, the apex emarginate, the inner side with two small teeth : body oblong-ovate : scutellum obvious : tarsi of the four anterior legs short, the three basal joints somewhat dilated in the males ; the hinder pair elongated and slender ; each tarsus terminating in two claws, of which the posterior pair are straight, the others curved.—*Curtis*, *B. E.* v. 207.

C. guttátus.—Oblong-ovate, subdepressed, shining black, the antennæ and legs pitchy-red, elytra with two pale rounded spots near the margin behind the middle. 4 : 2.—*Dytis. guttatus*, *Payk.* *Gyllen.* *Dytis. picinus*, *Marsh.*

Glossy black, the whole upper surface thickly and very obsoletely punctulated ; head with two transverse reddish spots on the crown ; the mouth, antennæ, and palpi ferruginous : thorax rather convex, the sides scarcely rounded and margined, sometimes impressed behind : elytra rather wider at the base than the thorax, dilated in the middle, the apex rounded, depressed above, with a stria of small punctures near the suture, and three others on the disk anteriorly formed of larger punctures which become scattered towards the apex ; the outer margin a little behind the middle having a pale rounded spot, and another near the apex, which is smaller and sometimes obsolete : under side shining black ; legs pitchy-red, the hinder pair pitchy-black.

In ditches and small brooks, not very frequent. Ditches at Craigcrook. Braid Burn.

C. fontinális.—Oblong-ovate, scarcely depressed, brassy-black, antennæ and legs pitchy-black, elytra with two very obsolete pale spots. 3¾–4 : 2. —*C. fontinalis*, *Leach.* *Steph. Illus.* ii. 66.

More oblong than the preceding, less depressed, black, slightly tinted with brassy; mouth black; antennæ pitchy-black, reddish at the base: elytra convex, scarcely dilated at the middle, the disk with three striæ, abbreviated posteriorly, the apex irregularly punctured: legs pitchy-black: in other respects nearly as *C. guttatus*.

Not common. Ditches in the Meadows.

C. fuliginósus.—Oblong-ovate, attenuated behind, convex, brown-black above, with an obscure metallic lustre, thorax and elytra margined with yellow. 4¾–5 : 2¼–2½.—*Dytis. fuliginosus, Fab. Gyllen. Dytis. uliginosus, Marsh.*

Brownish-black above, obscurely brassy, the surface very finely coriaceous; head with a small impression on each side in front, the anterior part, and two obscure spots on the crown, ferruginous; antennæ and palpi pale reddish: sides of the thorax ferruginous: elytra long, somewhat dilated in the middle and attenuated to the apex, convex anteriorly, the disk with three rows of punctures placed irregularly, and so obsolete as to be scarcely observable, the outer margin pale yellowish: under side pitchy ferruginous, the legs usually paler.

Not unfrequent in shallow pools with a muddy bottom, especially such as have the surface overrun with grass and aquatic plants. Braid marshes, &c.

C. maculátus.—Ovate, black above, thorax with a transverse yellow band, the elytra spotted and lined with pale yellow. 3½–4 : 2.—*Dytis. maculatus, Linn. Marsh. Don.* xiv. pl. 501. f. 1.

Shorter and more ovate than any of the preceding, convex, shining black, very finely shagreened: head rufous, the hinder part dusky with two red spots; palpi and antennæ rufescent: thorax black, with a transverse yellow band, narrowest in the middle, where it is sometimes interrupted, the ends occupying the whole breadth of the thorax or nearly so: elytra black, with three very obsoletely punctured lines, the lateral margins pale yellow, with four variable spots of a similar colour on each; one of them towards the scutellum of a square form, emitting posteriorly two narrow streaks, the outermost of which is often continued nearly to the apex; two placed towards the outer margin, bifid before and behind, and usually connected with the margin by a waved streak, and another, small and obscure, within the apex: under side pitchy-brown, legs reddish.

The spots on the elytra are very variable, sometimes they are nearly simple, at other times small and inconspicuous; they are generally very slightly branched in individuals which have the thoracic band interrupted in the middle.

Ponds and rivers, not rare in Scotland. Water of Leith. Braid Burn. Esk near Dalkeith; on one occasion it was observed in very great abundance in that neighbourhood, near the new bridge in the line of the Railway, not only in the river, but hanging on the plants near the margin.

C. uliginósus.—Ovate, convex, shining black, with the margin of the thorax and of the elytra, the antennæ and legs, rufo-ferruginous. 3½.—*Dytis. uliginosus, Linn. Gyllen. Dytis. Hybneri, Marsh.*

Black, slightly tinted with brassy on the thorax and elytra, finely punctulated, or somewhat coriaceous: head depressed, the anterior part, and two rather large transverse spots on the crown, rufous; antennæ pale rufous, the apex dusky: thorax much narrowed in front, with the angles acute, the sides obliquely rounded and broadly ferruginous-red: elytra rather wide, not dilated in the middle, the apex rounded, very convex towards the base, the lateral margins pale, with three very irregular series of punctures on the disk, and a few along the side of the suture towards the apex: under side shining black, the abdominal segments with a reddish margin: legs ferruginous, the hinder thighs usually dusky.

This species appears to be very scarce. It has been taken but once in this neighbourhood, and we have seen a specimen from Aberdeenshire.

C. chalcónotus.—Oblong-ovate, depressed, brassy-black, sides of the thorax and legs pitchy-red. 3½–4.—*Steph. Dytis. chalconotus, Illig.*

Somewhat depressed, the surface finely strigose or coriaceous: head with the front, and two spots on the vertex, ferruginous; antennæ and palpi obscurely ferruginous: thorax short, the sides obliquely rounded and of a pitchy-red colour, the hinder margin somewhat sinuated: elytra a little dilated in the middle, the apex rounded, somewhat depressed, brassy, the lateral margins narrowly piceous; the disk with three irregular rows of punctures which become numerous and scattered towards the apex: under side pitchy-black: legs pitchy-red, the hinder pair obscure.

Taken occasionally in ponds and ditches, but not so common as in many parts of England. Braid marshes.

C. bipustulátus.—Ovate, black, depressed, the surface covered with fine anastomosing longitudinal striolæ. 4¾–5 : 2½.—*Dytis. bipus. Linn. Marsh. Dytis. carbonarius, Fab. Gyllen.*

Shining black, depressed, particularly behind, the surface covered with fine short striolæ, as if drawn with the point of a needle: mouth, labrum, palpi, and antennæ ferruginous, the crown of the head with two obscure rufous spots: thorax short, rather rounded on the sides and margined, the basal line sinuated: elytra large, rounded at the apex, somewhat convex in front, considerably depressed behind, each with three irregular punctured lines on the disk: under side pitchy-black, striolated like the upper surface, the hinder segments of the abdomen margined with ferruginous; legs pitchy-black, the anterior tibiæ and tarsi testaceous.

With the exception of *Gyrinus natator*, this is the most common aquatic beetle that inhabits this neighbourhood. It is equally plentiful in all other parts of the south of Scotland. We observed it abundantly in Aberdeen and Perth-shires, and have received specimens from the northern extremity of the island.

C. Stúrmii.—Ovate, glossy black, the sides of the thorax, antennæ, and legs ferruginous, elytra dusky brown with a pale margin. 3½–4½ : 2.—*Dytis. Sturmii, Gyllen.*

Finely reticulate-strigose; head and thorax glossy black, the former with two ferruginous spots on the vertex, the upper lip and mouth pale ferruginous; thorax with the sides widely ferruginous, sometimes the edge only obscurely ferruginous, and a transverse row of obsolete punctures before and behind parallel with the margins: elytra rather large and convex, dusky-brown, with the outer margin widely ferruginous, the disk marked with three very obsolete striæ: under side pitchy-black, the abdominal segments margined with ferruginous: legs ferruginous, the thighs somewhat obscure.

Ditches in the Meadows. West end of Duddingston Loch and other places, occasional.

C. colláris.—Oblong-ovate, yellow, thorax generally unspotted, the elytra thickly sprinkled with black. 4½–5 : 2½.—*Dytis. collaris, Marsh. Gyllen. Colym. exsoletus, Steph. Illus.*

Not very convex, yellowish, shining: head dusky behind, with two transverse yellowish spots; antennæ and palpi pale, the tips of both dusky: thorax yellow, occasionally with two small dark spots behind, which are sometimes united by a narrow band of the same colour: elytra somewhat transparent, yellowish, thickly sprinkled or irrorated with small dark confluent spots, the outer margin and a narrow space on each side of the suture unspotted; the disk with three punctate striæ, the outer one interrupted and irregular: under side of the body and legs yellowish or testaceous.

Not common. Lochend. Muttonhole.

C. bipunctátus.—Ovate, yellowish above, black beneath, thorax with two black spots in the middle, the elytra mottled with black. 3¾–4 : 2–2¼. —*Dytis. bipunc. Fab. Marsh. Don.* ix. pl. 303. *Colym. nebulosus, Steph.*

Pale yellow, convex, shining: head and eyes blackish, the anterior part, and two spots on the crown, ferruginous; antennæ and palpi pale, the terminal joints tipped with black: thorax with two approximating black spots in the middle: elytra transparent, pale yellow, mottled with black, the outer margin, a rounded spot contiguous to it behind the middle, and a narrow line on each side of the suture, unspotted; the disk with three punctate lines, the punctures scattered towards the apex: under side pitchy-black; legs pale yellowish.

This beautiful species is not unfrequent. Like its congeners it may be found during the greater part of the year, but it is most plentiful in the spring. Braid marshes. Ditches at Craigcrook. Marshy spot in the King's Park, near the Powder Magazine.

C. áter.—Oblong-ovate, convex, black, elytra with two small longitudinal spots of a pale testaceous colour, the antennæ and four anterior legs ferruginous. 6 : 3½.—*Dytis. ater, Fab. Gyllen.*

The upper surface black, finely reticulate, somewhat shining: head obscurely ferruginous in front, with the usual pair of red spots on the crown; antennæ and palpi pale rufous: thorax with the sides narrowly pitch-red: elytra very convex anteriorly, sometimes indistinctly glossed with brassy, the outer margin piceous; each with three faint irregular striæ, a narrow line or longitudinal spot of a pale testaceous colour, rather behind the middle towards the outside, and another less distinct, placed obliquely near the apex: under side pitchy-black: anterior legs rufescent, the hinder pair pitchy-black.

The upper surface is sometimes piceous, with the margin pale, the under side and legs pale testaceous.

This species was introduced into the List of Edinburgh Insects in the Wernerian Memoirs as *C. obscurus*, from which it is probably not specifically distinct. The latter scarcely differs, but in having the antennæ and legs pitchy, and the spots on the elytra very indistinct. *C. ater* has occurred in the marshes at Currie, and among the Pentland Hills. *C. obscurus* we have taken frequently in Roxburghshire.

C. striátus.—Oblong, black, attenuated behind, elytra very finely striated across, legs black. 8½–9.—*Dytis. striatus, Linn.*

Head black, with very fine short irregular striæ, the upper lip and a band across the front, yellow, the crown with two ferruginous spots; antennæ black, pale at the base: thorax irregularly strigose, yellowish, the middle black, especially before and behind: elytra gradually widening from the base to the middle, beyond which they are attenuated to the apex, which is rounded; of a dusky-black colour, the outer margin dull yellowish, finely striated across, and having two obsolete lines of punctures on each, and a few scattered punctures towards the outer margin and suture: under side shining black, striated like the upper surface, but less distinctly; legs entirely black, strongly punctate.

Occurs now and then in stagnant waters.

C. fúscus.—Ovate, fuscous above, elytra finely striated across, the anterior legs yellowish. 8–8½ : 4–4½.—*Dytis. fuscus, Linn.*

Shorter than the preceding, and more obtuse behind: head very obsoletely punctulated: thorax scarcely strigose, yellow-testaceous, the disk more or less pitchy-brown: elytra pale fuscous, the base and lateral margins pale yellowish, finely striated across, with two pretty regular and rather deeply punctured striæ on the disk, another less regular towards the outer side, and a few punctures along the side of the suture towards the apex: anterior legs testaceous-yellow, the base of the thighs black; hinder legs black, the joints rufescent: in other respects like *C. striatus*, which it very closely resembles, and of which it may possibly be a variety.

Of occasional occurrence in this vicinity.

C. notátus.—Occurs occasionally in many parts of the south of Scotland.

C. nigro-aéneus.—" Scotland," J. C. Dale, Esq.—*Steph. Illus.*

C. femorális.—Pools by the side of the Tweed and Teviot, occasional.

C. affínis.—Dumfries-shire.

GENUS—DYTÍSCUS, *Linn.* From *δυτης, a diver.*—Antennæ setaceous, basal joint longest, 2d shortest, following clavate, decreasing slightly in length: external palpi with the three last joints of equal length, the terminal truncate; labial with the 1st joint minute, 2d and 3d nearly of equal length, the latter bent and truncate: mandibles emarginate at the apex, which is truncated obliquely: thorax transverse: elytra ovate, convex, smooth in the males, furrowed in the females: scutellum distinct: anterior tarsi patelliform in the males (Pl. I. fig. 6.); the middle pair with three basal joints dilated; the hinder pair long, thick, and tapering to the apex, where there are two very small claws.—*Curtis, B. E.* iii. 99.

D. circumfléxus.—Oblong-ovate, olive-black, testaceous-yellow beneath, the margin of the thorax all round, outer edge of the elytra, and centre of the scutellum, testaceous-yellow, the lobes of the sternum acute. (Pl. I. fig. 7.) 12–16.—*Illig. Fab.*

Head obsoletely punctulated, the anterior margin yellowish, the forehead with a rufous crescent-shaped spot; palpi and antennæ ferruginous, somewhat obscured towards the tip: thorax widely margined on all sides with yellow, having a very obsolete channel down the middle, and a series of dots along the anterior margin: scutellum yellowish in the centre: elytra with the outer margin widely yellow, the disk having three punctate striæ, and a series of faint punctures on the spaces between; the apex irregularly punctured: underside testaceous-yellow, the incisures blackish; legs testaceous, the tarsi and apex of the tibiæ in the hinder pair, blackish.

Apparently very scarce in Scotland: a few individuals only have been taken in this neighbourhood by Sir Patrick Walker.

D. marginális.—Blackish-olive, the thorax margined on all sides, and elytra externally, with yellow, the latter depressed towards the apex, and punctured; lobes of the sternum broad, somewhat acute. (Pl. I. fig. 8.) 12–16.—*Linn.*, &c.

Head smooth, black, with the upper lip and a broad band behind it, yellow; forehead with an angular rufous spot, and the crown with a slender elevated line; antennæ ferruginous, dusky upwards: thorax moderately convex, smooth, black, the sides, together with the anterior and posterior margins, yellow; obsoletely channelled down the centre, and impressed with a row of punctures along the front and sides: scutellum black: elytra scarcely wider at the base than the thorax, dilated behind the middle, convex and smooth anteriorly, depressed and punctured behind, with three punctate striæ on the disk; the colour olive-black, the outer margin yellow: under side testaceous-yellow, the margins of the segments dusky.

The female is finely punctulated on the head, and rather strongly on the thorax, each elytron with ten furrows, extending rather beyond the middle, the interstices and apex punctulated.

Not nearly so common as in the more southern parts of Scotland, and in England. Muttonhole. Ponds throughout the country.

This species, when recently taken, has a smell resembling that of liquorice. It is said to kill *Hydrous piceus,* which is nearly double its own size, by piercing it between the head and thorax, the only part of the body which is unprotected. Esper says it is affected by atmospheric changes, and indicates these, when in a state of confinement, by the height at which it remains in its jar.

D. punctulátus.—Black, lateral margins of the thorax and of the elytra yellow, lobes of the sternum rounded. (Pl. I. fig. 9.) 12–14: 6–7.—*Illig. Marsh. Don.* xv. pl. 540.

Black, very faintly tinged with olive, male glossy, the female more obscure: head with a faint impression on each side anteriorly, and a rufous angular spot on the forehead, the anterior margin and upper lip yellow: thorax with a very faint line down the middle, and a transverse line along the anterior margin, usually interrupted in the middle, the side alone yellow, the anterior suture sometimes ferruginous: elytra very little dilated in the middle, the outer margin yellow, the disk with three deeply impressed punctured striæ: under side black, the segments of the abdomen with an obscure ferruginous spot on each side; legs pitchy-ferruginous, strongly punctate.

The female is very thickly punctulated above, each elytron with ten furrows, extending beyond the middle.

This species appears to be considerably more plentiful than either of the preceding, both in this neighbourhood and in other parts of Scotland. Duddingston Loch. Braid marshes. Lochend, &c. It thrives well in confinement, and will live for a year or two in any small vessel, feeding on earth-worms, and shreds of fresh beef or mutton.

GENUS—ACÍLIUS, *Leach.*—Antennæ slender, setaceous, the 2d joint shortest; external palpi with the 2d joint obconic, 3d elongate-obconic, 4th longer than the 3d, thickest in the middle, and slightly attenuated at both ends, the apex rounded; labial with the terminal joint rather shorter than the penultimate, and rounded at the apex: mandibles bifid at the apex; thorax transverse: elytra depressed, ovate, smooth in the males, furrowed in the females and hairy: scutellum distinct: anterior tarsi patelliform in the males; the middle pair not dilated at the base.

Dr Leach proposed the establishment of this genus in the Zoological Miscellany. It is distinguished from *Dytiscus* by the great flatness of the species; by the hairy elytra of the females, which have but few striæ; and by the basal joint of the tarsi in the second pair of legs not being dilated. The parts of the mouth also vary, especially in the form of the mentum, and in the terminal joint of the external maxillary palpus, which, as we have said, is longer than the penultimate, and thickest in the middle[*].

A. sulcátus.—Brownish-black, head with four crescent-shaped yellow spots, thorax margined on all sides with yellow, and having a transverse band of the same colour in the centre, dilated at both ends, hinder thighs yellowish, black at the base. 7½–8 : 4½–5.—*Dytis. sulcatus*, *Linn.* *Don.* ii. pl. 68. f. 5. *Dytis. cinereus*, *Marsh.*

Head blackish, with two small impressions above the upper lip, and two others, one on each side, between the eyes; the upper lip, a band between the antennæ, two narrow lines on the forehead converging behind, two crescent-shaped spots on the vertex, and a patch before the middle of each eye, yellow; antennæ yellow, dusky at the apex: thorax thickly and rather deeply punctured, the margin all round yellowish, the disk brownish-black, with a transverse abbreviated yellow band, sometimes interrupted in the middle, and dilated at both ends into an angular spot: elytra dilated behind the middle, the apex obtusely rounded, scarcely convex in front, much flattened behind, thickly punctured, of a greyish colour, thickly sprinkled with black, the sutural and external margins yellowish; the disk with three very obsolete raised lines: under side black, punctulated; segments of the abdomen with a ferruginous margin, and a yellow spot on each side: four anterior legs yellowish, the patelliform tarsi black above, hinder pair black, the trochanters and apex of the thighs yellow[†].

A. canaliculátus.—Brownish-black, head yellow anteriorly, dusky behind, with two transverse yellow spots, legs entirely yellow. 6½–7 : 4¼–4. —*Acilius caliginosus*, *Curtis*, *B. E.* ii. 63.

Head yellowish, black behind, with two yellow crescent-shaped spots, which are often united: antennæ and thorax as in the above, the central band wider, particularly in the male: scutellum impunctate: elytra nearly as in *A. sulcatus:* breast strongly punctured; first segment of the abdomen yellow, the rest likewise yellow, with a blackish patch anteriorly in the middle; legs pale yellow.

Female with the thorax free from pubescence, the elytra with four hairy furrows.

This very distinct species is taken occasionally near Edinburgh, but it is far from frequent. Pond near Abercorn House.

FAMILY—GYRINIDÆ.

This family contains several foreign groups, but the genus undernamed is the only one which we have to record as British.

Genus—**GYRÍNUS**, *Linn.* From *γυϱεω*, *to go in a circle.* Whirlwig. —Antennæ shorter than the head, the basal joint very large, and produced externally into a triangular ciliated lobe, the rest forming a clavate mass, attached by a short peduncle to the upper side of the 1st joint (Pl. I. fig. 10.): external palpi with the three lowest joints small, the last larger, ovate; internal consisting of a single subulated joint: mandibles bidentate at the apex, with a tooth near the base: thorax short, transverse: anterior legs long, formed for walking, four hinder ones very short, compressed and ciliated externally, formed for swimming.—*Lat.* ii. 57. *Curtis*, ii. 79.

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[*] *Curtis*, vol. ii. fol. 63.

[†] *Acilius Scoticus* of Curtis is described from specimens captured near Kinordy in Forfarshire. It is closely allied to, if not identical with, the species above named.

The singular auriform antennæ of this genus induced Latreille to form it into a family along with *Parnus*, under the name of *Otiophori*. But, at an after period, that great entomologist approximated *Gyrinus* to the *Dytiscidæ*, thereby correcting the error he had previously committed, of confounding, as Mr Macleay observes, a relation of analogy with one of affinity. The *Gyrinidæ* live in society, and several species are extremely common in our ponds, and ditches by the way side. They swim flat upon the surface, with their shining backs above water, chasing each other in circles, or darting about in more irregular gyrations. When hemmed in to a corner of the pond, they make their escape by darting beneath the surface, carrying along with them a portion of air, which shines like quicksilver. Britain produces seven species of this genus. They are known in England by the name of Whirl-gigs. These insects fly well, and transport themselves with ease and rapidity from place to place. The females deposit their eggs on the leaves of aquatic plants. The eggs are very small, lengthened, in the form of little cylinders, and of a white colour, tinged with yellow. According to the observations of De Geer, they produced minute six-footed larvæ in the course of eight days, which swam in the water, or crept along the sides of the vessel in which they had been deposited. Neither he nor Roesel, however, could succeed in rearing them to a state of completion. These larvæ exhibit rather a singular aspect, and at first sight resemble small Scolopendræ. They are of a dingy white or greyish colour, and their clear transparent skin permits the view of their internal structure. Their bodies are long, slender, cylindrical, and divided into thirteen rings, which are deeply incised. The head is oval, very much elongated, and flattened both above and below. It is armed in front with a pair of comparatively large curved jaws, tipped with brown, which, when closed, meet with their points in advance of the head, but are capable of wide extension. The structure of these parts demonstrates a carnivorous disposition. The antennæ are very delicate, divided into four articulations, and equal the head in length. The first segment of the body is nearly twice as long as the others, and the three pairs of feet are attached to the first three segments. The eight following rings are garnished with very singular long, slender, transparent filaments, which float in the water without being apparently under the guidance of the animal. From their resemblance to the gills of the *Phryganeæ* and *Ephemeræ*, it is probable that these are the respiratory organs. The twelfth or penultimate segment of the body is furnished with four of these filaments, of much greater length than the preceding, and covered with long hairs or secondary filaments. The last segment, which is much less than the others, is terminated by four long and remarkable hooks, placed parallel to each other, with their points bent beneath inwards. The whole body seems filled with little globules of air, which are in frequent motion, sometimes towards the hind, and sometimes towards the other extremity. Modeer has described the transformations of these creatures in the Memoirs of the Royal Academy of Sweden. About the beginning of August, according to that author, the larvæ leave the water, and crawling up the stems of reeds, or other aquatic plants, they are transformed into nymphs, beneath the envelope of a small cocoon, pointed at both ends, and formed of a substance resembling grey paper. Towards the end of the same month, the perfect insect is excluded, and immediately jumps into the water. Modeer adds, that the cocoons are very frequently found pierced by the ovipositor of the ichneumon fly.

G. aéneus.—Oblong-ovate, blue-black, very glossy, head, sutural and external margins of the elytra, brassy, under side entirely brassy black, legs ferruginous. 3–3½ : 1½–1¾.—*Steph. Illus.* ii. 95.

Elongate-ovate, narrowed before and behind, blue-black, strongly tinted with brassy on the sides and under surface, highly polished and lustrous: head with two distinct impressions on the forehead; antennæ the colour of the body: thorax sinuated before and behind, the sides margined, the front with a crenated impressed line, obsolete in the middle, and two faint impunctate ones near the centre: elytra rather convex, the apex truncate, somewhat rounded, leaving exposed the terminal segment of the abdomen, which is fringed with hairs; each with eleven rather finely punctured striæ, the suture and outer margin brassy, the inflected portion of the latter piceous: under side brilliant brassy-black: legs ferruginous.

Duddingston Loch. Lochend, &c. Not scarce.

G. marínus.—Oblong-ovate, black-blue, glossy, elytra strongly punctate-striate, the inflected margin brassy, under side brassy-black. 2½–2¾ : 1½.—*Gyllen.*

Considerably smaller than the preceding, but resembling it in every thing except the elytra, which are scarcely dilated in front, the striæ composed of rather larger punctures, and more deeply impressed, the suture and margin brassy, tinted with green: body beneath and underside of the inflected margin of the elytra shining brassy: legs ferruginous.

Apparently not scarce in the ponds and lakes near Edinburgh. Duddingston Loch. Lochend.

G. natátor.—Ovate, blue-black, very glossy, the inflected margin of the elytra, apical segment of the abdomen, and legs ferruginous. 2½–3 : 1½.—*Linn.*

Ovate, rather wide and convex, blue-black, with a metallic lustre, very resplendent: head with two shallow impressions between the eyes, the mouth rufescent, antennæ blue-black: thorax with three transverse lines on each side, the anterior one punctured and parallel with the margin, the second continued across the disk, the posterior abbreviated and bent forwards: scutellum triangular, narrow, elongate: elytra with eleven striæ on each, composed of very minute punctures, the sides sometimes greenish, the inflected margin testaceous beneath: breast pitchy-red, the apical segment of the abdomen black above, ferruginous beneath; legs ferruginous.

This agile little creature appears to have been rather a favourite object of observation with the entomologist. "Water, quiet still water," says Mr Knapp, "affords a place of action to a very amusing little fellow *(Gyrinus natator)*, which, about the month of April, if the weather be tolerably mild, we see gambolling upon the surface of the sheltered pool; and every schoolboy who has angled for minnows in the brook, is well acquainted with this merry swimmer, in his shining black jacket. Retiring in the autumn, and reposing all the winter in the mud at the bottom of the pond, it awakens in the spring, rises to the surface, and commences its sports. They associate in small parties of ten or a dozen near the bank, where some little projection forms a bay, or renders the water particularly tranquil; and here they will circle round each other without contention, each in his sphere, and with no apparent object, from morning until night, with great sprightliness and animation; and so lightly do they move on the fluid, as to form only some faint and transient circles on its surface. Very fond of society, we seldom see them alone, or, if parted by accident, they soon rejoin their busy companions. One pool commonly affords space for the amusement of several parties; yet they do not unite, or contend, but perform their cheerful circlings in separate family associations. If we interfere with their merriment, they seem greatly alarmed, disperse, or dive to the bottom, where their fears shortly subside, as we soon again see our little merry friends gambolling as before. This plain, tiny, gliding water-flea, seems a very unlikely creature to arrest our young attention; but the boy with his angle has not often much to engage his notice, and the social active parties of this nimble swimmer, presenting themselves at these periods of vacancy, become insensibly familiar to his sight, and, by many of us, are not observed in after life without recalling former hours—scenes of perhaps less anxious days; for trifles like these, by reason of some association, are often remembered, when things of greater moment pass off, and leave no trace upon the mind [*]." Wordsworth has likened a beetle to

> "A mailed angel on a battle day;"

And Messrs Kirby and Spence describe the subjects of our present notice as being "covered with lucid armour: when the sun shines, they look like little dancing masses of silver and brilliant pearl [†]." They, however, exhale a disagreeable and rancid odour.

G. minútus.—Oblong-ovate, narrow, shining blue-black above, testaceous-red beneath. 1¾-2.—*Fab.* *Steph. Illus.* ii. pl. xiii. f. 2.

Small, narrow, and somewhat elongate; scutellum triangular, short; elytra scarcely dilated, more deeply punctate-striate than in the *G. natator*, blue-black above, the sides greenish-brass; the inflected margin, under-side of the body and legs, entirely pale testaceous, the segments of the abdomen sometimes blackish in the middle.

Apparently a solitary species, and of rather rare occurrence. We have taken single specimens in the Water of Leith, and among the marshes of the Braid Hills [‡].

SECTION—RYPOPHAGA.

SUBSECTION—PHILHYDRIDA, *Macleay*.

FAMILY—PARNIDÆ.

GENUS—PARNUS, *Fabricius*.—Antennæ shorter than the head, lodged in a small cavity under the eyes, the 2d joint compressed and very much produced, concave for the reception of the remaining joints, which form a serrated mass, attached to it by a small peduncle near the base (Pl. I. fig. 11.): maxilla bilobed, supporting a single palpus, which has its 2d and 3d joints cup-shaped, 4th long ovate-conic; labial palpi short, 3-jointed, 1st joint minute, 2d clavate, 3d oval: mandibles bidentate at the apex, with two small teeth just below it: thorax with a longitudinal impressed line on each side: body covered with rather long hairs: tibiæ cylindric, without spines: terminal joint of the tarsi long and clavate.—*Curtis*, ii. 80. *Leach*, *Zool. Mis.* iii. 88.

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[*] *Journal of a Naturalist*, p. 307.

[†] *Introduction to Entomology*, vol. ii. p. 372.

[‡] *G. villosus* is readily distinguished from the other *Gyrini* by its irregularly punctured and pubescent elytra. It is the only other Scotch species with which we are acquainted, but it has not yet been met with in the Edinburgh district. Dr Greville added a specimen to our collection last summer. He found it by the side of Loch Lomond.

The *Parni* are said to inhabit the roots and blades of grass at the sides of ponds and ditches; and they also occur among rejectamenta of marshes and meadows after floods, during spring and summer. This is the only genus of the family found in Britain.

P. prolifericórnis.—Oblong, olive-brown, villose, elytra thickly punctured, obscurely substriated towards the sides and apex. 2–2¼.—*Fab. Gyllen. Marsh.*

Body covered with long dense pubescence: head retracted, almost concealed within the thorax; the latter somewhat narrowest in front, very convex, with an oblique longitudinal line on each side, most remote from the margin behind; the hinder angles prominent and acute: elytra convex, densely punctured, and very obscurely striated towards the sides and apex: under side clothed with dense depressed ashy pubescence; legs dull ferruginous, the tibiæ more obscure.

Found in moist places, by the sides of ponds, and in marshes, not unfrequent in the spring. Hunter's Bog. Margin of Duddingston Loch, &c.

P. auriculátus.—Ovate, black, tomentose, thickly punctate, legs dull pitchy red. 2½.—*Illig. Dryops auriculé*, *Lat. Hist. Nat. des Crust. et des Insectes*, pl. 78. f. 2.

Proportionally wider and more ovate than the preceding, dusky black, covered with long hairs; the punctation of the head and thorax rather deeper than in *P. prolifericornis*, in other respects nearly the same as in that species: scutellum with the pubescence depressed, and of a yellowish hue: elytra somewhat shining, thickly and rather deeply punctate, with several rudimentary striæ at the base; underside clothed with yellowish shining depressed hairs; legs very obscure pitchy-red.

Less frequent than the preceding: under stones on the sides of the Pentland Hills, early in spring, and elsewhere, occasional.

FAMILY—LIMNIIDÆ.

GENUS—ÉLMIS, *Lat.* The word is used by Galen as the name of an intestinal worm.—Antennæ the length of the thorax, subfiliform, 11-jointed, the two basal and two terminal joints stouter than the intermediate ones, the apical joint longest, subovate: maxilla small, the apex rounded and densely ciliated, bearing two palpi, of which the external is 4-jointed, with the terminal one longest; internal consisting of two joints: labial palpi with the two lowest joints small, terminal larger, ovate: mandibles bifid at the apex, the internal margin with a broad membrane: head retractile within the thorax up to the eyes; thorax subquadrate: legs elongate; tibiæ slender, without spines; tarsi 5-jointed, the 5th joint long and clavate.—*Lat. Gen. Crust.* ii. 49. *Curtis*, *B. E.* vii. 294.

Some species of this genus, with a view probably to escape the observation of their enemies, disguise themselves by covering their elytra with a thick coating of mud, which becomes almost as hard as stone.

E. Volckmári.—Oblong, black, slightly brassy, thorax convex, punctulated, with an elevated line on each side, legs blackish, tarsi obscurely ferruginous. 1¼-1⅓.—*Curtis, B. E.* vii. 294. *Dytis. Volckmari, Panz. Chry. buprestoides, Marsh. Limnius Volckmari, Gyllen.*

Oblong-ovate, black, slightly brassy; head deflexed, punctulated; antennæ pitchy-red, the apex obscure: thorax with the anterior margin rounded, and projecting a little over the head, having an elevated line on each side, remote from the margin, and approximating anteriorly, inclosing a convex, shining, punctured space, which is transversely impressed at the base: elytra scarcely wider at the base than the thorax, somewhat dilated in the middle, and attenuated from thence to the apex, rather convex, with eight punctured striæ on each, the interstices minutely punctulated: under side pitchy black, the sides with a dense yellowish pubescence; legs black, the tarsi somewhat castaneous.

In shallow pools by the margins of rivers and lakes, usually found adhering to the under side of stones. Sides of the Almond. Water of Leith above Coltbridge. It is not unfrequent in many parts of the Teviot; and we have seen specimens from the Tweed.

E. variábilis.—Black or pitchy-black, antennæ and legs reddish, thorax with a longitudinal line on each side, elytra punctate-striate, the three external striæ rather elevated. ¾-1.—*Steph. Illus.* ii. pl. xiii. f. 4.

Black, or piceous, slightly brassy, rather depressed and narrow; head and thorax dull black, the latter with two longitudinal lines, which approximate in front, inclosing an obsoletely punctulated space, scarcely convex anteriorly: elytra scarcely dilated in the middle, not unfrequently reddish, at other times pitchy black, glossed with brassy, punctato-striate, the three striæ next the outer margin raised into acute ridges: under side piceous; legs and antennæ dull rufous.

Scarce. Water of Leith, above Coltbridge. It has been found in the Annan, near Moffat, and in the Teviot, above Ancrum Bridge.

Besides the above, the following species of Elmis have been ascertained to inhabit Scotland.

E. lacústris, Banks of the Teviot opposite Minto, rather plentiful.

E. áeneus, Water of Dryfe, Dumfries-shire.

E. cúpreus, Water of Dryfe, taken by Mr Little.

E. parallelopípedus.—Not very rare in the border counties of Scotland.

GENUS—ENICÓCERUS, *Stephens*. Named from *ενικος singular*, and *κερας a horn*, in allusion to the peculiar structure of the antennæ.—Antennæ the length of the head, the basal joint very long, curved, and slightly geniculated at the base, 2d thicker ovate-truncate, three or four of the following very minute and obscure, the five last of nearly equal thickness, penultimate cup-shaped, terminal orbicular, (Pl. I. fig. 12.): maxillary palpi with the 2d and 3d joints of equal length, the former clavate, the latter robust, pear-shaped, 4th or terminal very narrow and minute: head triangular: thorax broader than the head: elytra oval, wide, depressed: tarsi 4-jointed, terminating in two large claws.—*Curtis, B. E.* vii. 291. *Steph. Illus.* ii. *Appen.* 196.

E. viridiǽneus.—Brassy-green, thorax with an oblique groove near each of the hinder angles, and two foveæ in front, legs piceous. 1½–1½. —*Steph. Illus.* pl. xv. f. 6.

Rather depressed, of a brassy green colour: head large and triangular, with an impression across the front, and another on each side behind; antennæ pale: thorax very convex, punctured, with a deep line down the middle, a fovea on each side in front, and a groove on each side at the base, placed obliquely: elytra wider than the thorax, strongly punctate-striate, the interstices rather elevated, particularly that next the shoulder: under side black, (pale in immature individuals); legs pitchy, more or less obscure.

Water of Leith, Esk, Almond, &c.: It should be sought for beneath small stones at the margin of the water, and will usually be found adhering closely to their surface, or embedded in the mud and confervæ with which they are often covered. It does not appear to be a scarce insect in Scotland: by the sides of the Teviot we have frequently observed upwards of a dozen individuals on a single stone, and it is likewise plentiful in Dumfries-shire.

The only other genus included in the family *Limniidæ,* as constituted by Mr Stephens, is the Georyssus of Latreille. It comprehends but one species *G. pygmæus* (*Steph. Illus.* ii. pl. xiii. f. 3.) which has lately been found in the Annan near Moffat.

FAMILY—HELOPHORIDÆ.

Though these are aquatic insects they may be said rather to walk in the water than to swim. They may be seen floating on the surface with the breast uppermost, and occasionally take flight from the stalks of aquatic plants. Mr Stephens observes that they are carnivorous in their larva state, but herbivorous in their mature condition.

GENUS—HÝDROCHUS, *Germar.* Named from *υδωρ water,* and *οικεω to inhabit.*—Antennæ shorter than the head, abruptly clavate, 1st joint long and slightly curved, 2d short ovate, rest minute and obscure, the three last forming a club, of which the two first joints are slightly produced on the one side, terminal long and conical: maxillary palpus long, the 2d and 3d joints subclavate, terminal very long, subfusiform: eyes prominent: thorax longer than broad: elytra wider than the thorax: tarsi 4-jointed, 3 basal joints short, the last very long and clavate; claws large.—*Curtis, B. E.* viii. 359.

H. elongátus.—Pitchy-back, or obscure brassy-black, elytra deeply punctate-striate, the alternate interstices elevated into an acute ridge. 1¾–2 : ¾.—*Eloph. elongatus, Fab. Hydrophilus cicindeloides, Marsh.*

Brownish-black, usually tinted with brassy: head covered with large punctures; the palpi and antennæ reddish-brown: thorax nearly the same breadth as the head, elongate-quadrate, rather narrowed behind, thickly punctured, having three foveæ arranged in a transverse row near the middle, and two close to each other behind: elytra convex, widest behind the middle, deeply punctate-striate, the alternate interstices elevated, the elevated portion on the second space extending from the base to the middle, that on the third space from the middle towards the apex: under side brownish-black: legs piceous.

Not common: pond on the north side of Braid Hills, near the farm house. It has been found in Dumfries-shire and some other parts of the south of Scotland.

H. brévis.—Black, elytra with four slightly crenated ridges on each, spaces between impressed with two rows of large punctures. 1¼–1½ : ¾. —*Eloph. brevis, Herbst.*

Shining black above; head and thorax marked nearly as in the preceding species, the latter proportionably broader anteriorly: elytra rather wide, convex, the sutural and external margins, and four lines on the disk of each, elevated and slightly crenate, the spaces between with two rows of large punctures: under side black, strongly wrinkled across: legs pitchy-black, the middle of the tibiæ and the tarsi reddish.

Usually regarded as a very scarce species. In this neighbourhood it has been taken in the ditches near Craigcrook, by Mr James Stark; and a considerable number of specimens have been procured from the Braid marshes.

GENUS—**HELÓPHORUS**, *Leach.* From ἑλος, *a marsh*, and φοϱεω, *I penetrate.*—Antennæ shorter than the head, clavate, 1st joint longest, robust and slightly curved, 2d shorter than the 1st, 3 following minute, the 4 last forming a club: external palpi about one half longer than the labial, the terminal joint long, fusiform; eyes sessile: thorax wider than long, marked with longitudinal furrows: fore legs shortest.

A. *Elytra without elevated ridges.*

H. aqúaticus.—Obscure brassy-brown, thorax narrowed behind, the sides sinuated, elytra greyish, punctate-striate, with an abbreviated stria near the scutellum. 2½–3.—*Silpha aquatica, Linn. Hydroph. stagnalis, Marsh.*

Head brown-black, minutely granulated, and obsoletely marked with a short line down the forehead, united to a triangular one rising from the anterior margin of the eyes; palpi and antennæ pale testaceous: thorax brownish, with coppery and green reflections, having five longitudinal furrows, of which the central one is straight, the rest flexuose, the spaces between flat and minutely granulated, the sides sinuated towards the base, which is thereby rendered narrower than the front: elytra rather pale, with a few inconspicuous dusky spots, deeply punctate-striate, the second interstice widened at the base for the admission of a short stria: under side black, thickly clothed with short silky pubescence; legs pale yellowish.

The most common insect of the family, abounding in almost every pond and ditch throughout the country. It is almost always found covered with mud, in such an ingenious manner, that when feeding in its little pool, it is with difficulty distinguished from the subjacent soil, either by enemies of its own class, or the no less dangerous eye of the practised entomologist.

H. granuláris.—Brassy-brown, somewhat shining, the sides of the thorax equally rounded, elytra punctate-striate, the interstices rather convex. 1½–1¾.—*Steph. Bup. granularis, Linn. Eloph. granularis, Gyllen.*

Scarcely half the size of the preceding, which it very closely resembles, particularly in the colour and sculpture of the head and thorax, differing only in the sides of the latter being rounded, not sinuated as in *H. aquati-*

cus: elytra dusky; the outer margin paler, strongly tinted with brassy, having ten deeply punctured striæ on each, the interstices slightly convex, the second without an abbreviated stria at the base: under side black, with dense depressed silky pubescence; legs pale.

Frequent in ponds and marshy places; often taken on the wing, and in situations considerably remote from any collection of water.

H. gríseus.—Thorax green coppery, the sides nearly straight, elytra pale, spotted with dusky. 1¼.—*Steph. Hydroph. affinis, Marsh.*

Rather narrow, shining; head and thorax green and coppery, sculptured as in the two last species, the sides of the thorax nearly straight and slightly oblique: elytra long, rather convex, regularly punctate-striate, without an abbreviated stria near the scutellum, the colour pale greyish, sprinkled with dusky spots, two of which approximate and form a triangular patch on the suture a little behind the middle: under side and legs as in the last.

On walls, rocks, &c.: during warm weather, in the neighbourhood of marshes and ponds, not scarce. Braid Hills, Duddingston, &c.

B. *Elytra with elevated ridges.*

H. Fénnicus.—Dusky-ferruginous, elytra greyish, punctate-striate, with a short stria near the scutellum, the alternate interstices elevated into smooth acute ridges. 2½–2¾.—*Eloph. Fennicus, Payk. Gyllen. Hydroph. cinereus, Marsh.*

Head and thorax dusky testaceous, in shape and sculpture very nearly as in *H. aquaticus;* palpi and antennæ pale, the club of the latter obscure: elytra greyish, rather convex, punctate-striate, with an abbreviated stria near the scutellum, the alternate interstices raised into smooth ridges, which are marked with a few black tubercular spots behind the middle, the spaces between the ridges flat and impressed with two rows of punctured striæ; under side pitchy brown, with silky pubescence, the apex of the abdomen pale ferruginous: legs pale testaceous.

Has been taken at Figget Whins, and a few other places in the vicinity, but it is rather rare.

H. núbilus.—Testaceous-brown, elytra punctate-striate, spotted with black, the alternate interstices elevated into crenulated ridges. 1½–1¾.—*Eloph. nubilus, Gyllen. Hydroph. nubilus, Marsh.*

Thorax convex on the disk, the sides somewhat depressed, and slightly sinuated towards the base, which is narrower than the front, dusky brown, with five longitudinal furrows; elytra brown ferruginous or testaceous, clouded with black spots, the alternate spaces between the striæ raised into ridges, the summits of which are slightly crenated, the spaces between the ridges flattish, and having a deep punctured stria on each side: under side and legs as in the last.

Rather more frequent than H. Fennicus, but still scarce. Pentland Hills. Sides of the Esk below Dalkeith, &c.

GENUS—HYDRÁENA, *Kugellan.*—Antennæ short, the basal joint long and bent, 2d short ovate, three following minute, the six last forming an elongate club, which is considerably thickened towards the apex: maxillary palpi more than twice the length of the antennæ, 4-jointed, 1st joint short, 2d much elongated, bent, slender, thickened at the tip, 3d half the length of the 2d, obconic, 4th longer than the third, fusiform: head wide, porrect; thorax quadrate, somewhat elongate: legs slender.—*Lat. Gen. Crust.* ii. 69.

H. ripária.—Oblong, piceous or brownish-black, elytra very closely punctate-striate, legs rufous. 1.—*Hydroph. longipalpis, Marsh. Eloph. minimus, Fab. Gyllen.*

Rather depressed, shining: head wide, triangular, truncated in front, punctulated; antennæ and palpi rufous, the apex of both dusky: thorax dilated on the sides into a somewhat salient angle, very little convex above, punctured, with a longitudinal impression towards each side, and some slight inequalities before and behind: elytra dark reddish-brown, nearly black, very closely covered with rows of oblong punctures: under side black, sparingly clothed with silky hairs: legs rufous.

Under stones in shallow pools by the sides of the Water of Leith, Esk, and Almond. It is most readily procured by stirring the mud and small stones, the slightest eddy in the water being sufficient to raise it from the bottom, and bring it to the surface. It is very plentiful in many parts of the Teviot, and occurs in Dumfries-shire.

FAMILY HYDROPHILIDÆ.

This family is formed chiefly by a dismemberment of the great Linnean genus Dytiscus, and more especially by such as fall into the genus Hydrophilus of Geoffroy, which has itself been subdivided in recent times. The species are more convex in their general forms than the Dytiscidæ, and their antennæ are dissimilar, but their instincts, modes of life, and general transformations, bear a great resemblance to those of that Family. The largest water insect of Great Britain *(Hydrous piceus)*, which however, has not yet occurred in Scotland, belongs to our present division *. Many of the species are also of extreme minuteness.

GENUS—LIMNÉBIUS, *Leach*. From λιμνη a *marsh*, and βιος *life*.—Antennæ short, slender, clavate, the club 6-jointed: maxillary palpi longer than the antennæ, the basal joint minute, the three following nearly of equal length, the terminal fusiform: thorax short, transverse, dilated at the sides: body rather depressed, the scutellum large, and the elytra truncated at the apex.

L. truncatéllus.—Rather short, ovate, obtuse behind, entirely glossy black above, legs piceous. 1–1¼.—*Steph. Hydroph. truncatellus, Fab.*

Of an uniform deep glossy black above; head with a slender arched line across the forehead; palpi rufescent: thorax large, wider than long, the sides rounded and narrowly margined, the surface very minutely and obsoletely punctulated: scutellum large in proportion to the size of the body, triangular: elytra obsoletely punctulated, with a short down, so scanty as to be scarcely perceptible, the surface a little convex, the apex truncated: under side black, with thinly scattered short hairs; legs pitchy.

Not scarce in shallow stagnant water, usually found among the mud, or adhering to the submerged stems and roots of plants.

L. nígrinus.—Oblong-ovate, obtuse, smooth, rather shining, black, antennæ and legs pitchy. ¾–1.—*Steph. Illus. Lim. nigricans, Steph. Illus. Der. nigricans, Marsh.*

For an account of the structure and transformations of the above named species, see a posthumous work of the celebrated Lyonnet, lately published under the title of "Recherches sur l'Anatomie, et les Metamorphoses de differentes Especes d'Insectes."—Paris, 1832.

More oblong than the preceding, and of a smaller size, not so glossy, the elytra not unfrequently dull testaceous: antennæ and legs piceous.

Found with the preceding occasionally. It has been likewise taken in the river Annan.

L. nítidus.—Ovate, depressed, shining-black, the margin of the thorax and legs pale rufous. ½–¾.—*Hydroph. nitidus*, *Marsh.*

Differs from the two preceding by its inferior size, the greater depression of its upper surface, and by having the margin of the thorax and legs pale rufescent.

Not common: Water of Leith above Coltbridge.

L. lutósus is likewise a Scotch species.

GENUS—HYDRÓBIUS, *Leach.* Named in reference to their place of abode, from *υδωρ water*, and *βιος life.*—Antennæ shorter than the head, 9-jointed, 1st joint long, curved, somewhat clavate, 2d scarcely half the length of the 1st and more slender, 3d shorter than the 2d, 4th and 5th subglobose, 6th compressed transverse, the rest forming a club, of which the terminal joint is largest, subovate (Pl. I. fig. 13.); maxillary palpi long, 1st joint minute, 2d and 4th longest, the latter convex on the outside, the apex rounded: mandibles bifid at the apex: body ovate or globose: tarsi 5-jointed, four first joints short and equal, 5th long and slender.—*Curtis*, *B. E.* vi. 242.

H. fúscipes.—Oval, pitchy-black, very thicky punctured, elytra punctate-striate, legs piceous, the tarsi rufescent. 3¼ : 2.—*Dytis. fuscipes*, *Linn.* *Hydroph. Scarabæoides*, *Fab.*

Oval, obtuse before and behind, shining brownish-black above, sometimes with a very faint tinge of green or violet, the whole surface thickly and finely punctulated: head anteriorly with a few rather large punctures on each side, placed transversely, and a small impression, composed of confluent punctures, on the inside of each eye; palpi and antennæ ferruginous, the club of the latter dusky: thorax transverse, the sides scarcely rounded and margined, the angles obtuse, the sides with a few rather large scattered punctures, and two very shallow impressions: elytra large, very convex, the apex obtusely rounded, each with ten punctured striæ; the two outermost approximating anteriorly, the second interstice with a short stria at the base, and the alternate ones impressed with a few distant rather large punctures: under side dull black, pubescent; legs pitchy, with rufescent tarsi.

Ponds and ditches common, particularly in the spring.

H. orbiculáris.—Nearly hemispherical, deep glossy-black, very thickly punctulated, elytra with a single stria on each side of the suture, not reaching to the base. 2–2¼ : 1¼.—*Hydroph. orbicularis*, *Fab.*

Deep black above, the surface very equal, glossy, and thickly punctulated: head convex, palpi and antennæ piceous: thorax very convex, without impressions, the sides margined, and slightly rounded: elytra covered with rather larger punctures than the thorax, the outer side margined, the sutural edge with a simple stria, beginning a little before the middle, and extending to the apex, where it is most deeply impressed: under side black, with obscure ashy pubescence: legs pitchy-black, the tarsi, and sometimes the tibiæ, rufescent.

A scarce species. We have taken it sparingly at the west end of Duddingston Loch, but have not heard of its occurrence elsewhere in Scotland. It is not rare in the south of England.

H. bipunctátus.—Subhemispheric, head and thorax brownish-black, the former with a spot before each eye, the latter with the sides, pale yellowish, elytra greyish sprinkled with black, closely and irregularly punctate-striate. 1¼–1½.—*Fab. Marsh. Chrysomela minuta, Linn.*

Head punctulated, black, a small spot before each eye, together with the palpi and antennæ pale: thorax punctulated, black, the sides widely margined with pale yellowish: scutellum black: elytra yellowish-grey, sprinkled with black, thickly punctate, the punctures arranged in crowded striæ, which are irregular on the disk, and can scarcely be traced on the outer margin, which is to a greater or less extent free from dusky spots: under side black; legs pale.

Individuals are found not unfrequently, in which the head and disk of the thorax are of a reddish-brown colour. Occurs in considerable plenty by the sides of most of the ponds and other collections of water in this neighbourhood; it is likewise common in nearly all parts of the country which we have had an opportunity of examining.

H. minútus.—Subovate, very convex, pitchy-black, the lateral margins of the thorax and of the elytra pale, the latter with a single sutural stria: legs pitchy black. 1¼–1⅓.—*Hydroph. minutus, Marsh.*

Somewhat ovate, nearly hemispheric, shining pitchy-black, very finely punctulated: head black, unspotted; palpi pale, the tip blackish: thorax narrowly pale on the sides: elytra with a single impunctate stria on each side of the suture, obsolete anteriorly, the outer margin pale testaceous: under side pitchy-black, the legs nearly of the same colour.

In such places as the last, occurring pretty frequently. Braid marshes. Ditches at Duddingston.

H. torquátus.—"Raehills, Dumfries-shire." *Rev. Wm. Little.*

H. bipustulátus.—Raehills, and the Teviot below Jedburgh.

H. melanocéphalus.—Forfarshire, Aberdeenshire, &c.

FAMILY—SPHÆRIDIIDÆ.

GENUS—CÉRCYON, *Leach.*—Antennæ scarcely the length of the thorax, nine-jointed, slender at the base, the radical joint long, the next 4 minute, the rest forming a loosely imbricated club: maxillary palpi nearly the length of the antennæ, the 2d and 3d joints almost equal, the former much thickened at the apex, the latter slender, terminal shorter, robust, tapering to the apex: body ovate, very convex, or nearly hemispheric: thorax very short: elytra striated: tarsi 5-jointed, the 1st and last joints longest, the anterior pair simple in both sexes.—*Zool. Mis.* iii. 95.

C. littorále.—Oval, shining pitchy-black, slightly depressed, elytra pale at the apex, and having a reddish spot at the base near the scutellum. 1¼–1½.—*Sphæridium littorale, Gyllen.*

Head large, convex, finely punctulated; palpi and antennæ ferruginous: thorax moderately convex, minutely punctulated and margined: elytra somewhat dilated in the middle, rather depressed above, punctate-striate, the striæ deepest nearest the apex, the interstices punctulated; the apex pale, and the base with an inconspicuous reddish spot near the scutellum: under side black, legs pitchy-ferruginous.

Var. *b.* Thorax and elytra livid-testaceous, legs reddish, with the base of the thighs dusky.—*C. dilatatum, Steph.*

In considerable plenty on the shore at Figget Whins, and other parts of the coast.

C. ruficórne.—Black, slightly depressed, elytra with the outer margins piceous, and the apex pale red, antennæ and palpi reddish-brown. 1–1½. —*Kirby. Steph.*

Ovate, shining black, finely punctulated; head and thorax very equal on the surface, the latter with the sides somewhat dilated, and often slightly piceous: elytra rather depressed, with ten punctured striæ on each, the outer one abbreviated, of a black colour on the disk, the outer margins piceous, and the apex testaceous: under side black; legs pitch black: antennæ and palpi reddish-brown.

Not unfrequent. Shore near Portobello and elsewhere, most prevalent during the early spring months.

C. lævigátum.—Very convex, glossy black, antennæ and legs obscure red, the spaces between the striæ on the elytra impunctate. 1–1¼.—*Kirby. Steph.*

Much more convex than any of the preceding species; entirely glossy black except the apex of the elytra, which is rather pale or piceous: head and thorax minutely punctulated; antennæ dull red, the club more obscure: striæ on the elytra rather faint, the spaces between without punctures: under side black; legs pitchy-red.

Apparently rather scarce: it has been taken on the shore near Newhaven, during mild weather in April.

C. obsolétum.—Rounded-ovate, shining black, punctulated, the apex of the elytra and legs pitchy-red. 1½–1¾ : 1–1¼.—*Sphæ. obsoletum, Gyllen. Der. lugubris, Marsh.*

Larger than the other species, and of a more rounded form: head and thorax finely punctulated, black not very glossy: palpi and antennæ pitch black: elytra black, the apex, and usually the sides, brown or pitchy, each with ten punctured striæ not very deeply imprcssed, the spaces between punctulated: under side obscure black: legs reddish-brown, the thighs nearly black.

Frequent on wall tops beneath trees, and by the sides of highways, throughout the summer and autumn.

C. píceum.—Ovate, black, very smooth and glossy, the elytra and legs piceous. 1–1½.—*Steph. Dermestes piceus, Marsh.*

Head and thorax pitch black; the antennæ rather of a paler hue; elytra likewise piceous, the apex rather pale, marked with very faint striæ, and the interstices rather thickly punctulated; under side black: legs piceous.

Of occasional occurrence throughout the south of Scotland. Cramond. Morningside.

C. pícinum.—Somewhat ovate, black above, very smooth and glossy, dull testaceous beneath, elytra and legs piceous. 1½–1¾.—*Steph. Dermestes picinus, Marsh.*

Usually rather larger than the preceding, subovate: head, thorax, and appendages of the mouth, black: elytra punctate-striate, of a uniform pale pitchy colour; under side dark testaceous: legs piceous.

Cramond and elsewhere, occasional.

C. sutur*á*le.—Somewhat ovate, head and thorax glossy-black, elytra chesnut colour, with the suture black, legs reddish. 1¼–1½.—*Steph.*

Rather small, subovate, deep glossy black, very finely punctulated; elytra of a bright chesnut colour, the suture black from the base nearly to the apex, the surface marked with rather faintly punctured striæ, the spaces between which are somewhat convex: under side black: legs reddish, the thighs with a dusky spot in the middle.

Not very scarce, especially during the spring months.

C. later*á*le.—Somewhat ovate, piceous, the sides of the thorax and apex of the elytra pale reddish, the latter obsoletely striated, legs pitchy red. 1½. *Steph.*—*Dermestes lateralis, Marsh.*

Piceous, glossy, and thickly covered with rather deep punctures: antennæ and palpi rather pale: thorax dark pitchy on the disk, the lateral margins pale reddish: elytra pitchy, with a pale apex, faintly punctate-striate and punctured; under side black: legs dark red.

Not unfrequent in various situations.

C. haemorrhoidale.—Rounded-ovate, very convex, shining black, elytra ferruginous at the apex, antennæ and legs pitch black.—1½.—*Spharid. hæmorrhoidale, Fab. Gyllen.*

Short and convex: head punctulated, black; palpi black; antennæ black, somewhat piceous: thorax punctured like the head, and having a small rounded impression in the middle behind, before the scutellum; the latter not elongate: elytra rather deeply punctate-striate, the intermediate spaces thickly and very minutely punctured, the colour black or pitch-black, with the apex chesnut-red: under side and legs black.

Common in cow pastures, farm-yards, &c.

C. melanoc*é*phalum.—Oblong-ovate, shining black, punctulated, elytra rufo-testaceous, with three black marks at the base, the central one large and triangular. 1.—*Dermestes melanocephalus, Linn.*

Oblong-ovate, slightly attenuated behind, the whole surface very finely punctulated and glossy: head and thorax deep black: elytra testaceous-red, sometimes approaching to castaneous, with a broad common triangular mark of black at the base, the edges not distinctly defined, and another of the same colour on each side at the basal angles; the disk of each with ten faintly punctured striæ: legs nearly the colour of the elytra, trophi and antennæ black.

Very frequent in such places as the preceding: found also occasionally on flowers.

C. quisq*ú*ilium.—Oblong-ovate, head and thorax black, the sides of the latter, together with the elytra and legs pale yellowish. 1–1½.—♂ *Scarabæus quisquilius, Linn. Der. quisquilius, Marsh.* ♀ *Coccinella unipunctata, Linn. Der. unipunctatus, Marsh.*

Head black, convex, punctulated; antennæ pale: thorax closely punctured, black on the disk, the sides of a pale hue: elytra pale yellowish, faintly punctate-striate, the spaces between the striæ minutely punctured; under side pitch black: legs rusty red.

The female is larger than the male, and conspicuously distinguished by having a large black spot on the elytra, somewhat heart-shaped, placed a little behind the middle.

Common in all parts of the country.

The other species of this extensive genus which we have ascertained to inhabit Scotland, are *C. merdarium*, *C. bimaculatum*, *C. terminatum*, *C. convexior*, *C. ustulatum;* the three latter taken in Dumfries-shire, the other two in Roxburghshire.

GENUS—SPHÆRÍDIUM, *Fab.* From σφαιρηδιον, in allusion to the globular shape of the insects.—Antennæ scarcely the length of the thorax, 9-jointed, the four terminal joints forming a compact, rather elongate club: maxillary palpi with the two terminal joints equal in length, the 2d and 3d clavate, 4th acuminated: body rounded, oval, wide, not very convex: thorax short: elytra without striæ: tibiæ much compressed and furnished with long spines; anterior tarsi simple in the female, and having the terminal joint enlarged in the male.

S. quadrimaculátum.—Shining black, the margin of the thorax and of the elytra yellowish, the latter with two large reddish spots on each, legs testaceous, the thighs with a black spot. 2¼–2¾.—*Steph.* *Der. quadrimaculatus*, *Marsh.*

Body somewhat ovate-quadrate, the whole surface very finely and minutely punctulated, and of a black colour: head orbiculate, rather convex: antennæ pale: thorax slightly sinuated behind, the sides edged with pale yellow: scutellum narrow and elongate: elytra convex anteriorly, somewhat flatter towards the apex, and marked with a single stria on each side of the suture, the outer margin yellowish, and each having a large reddish spot on the shoulder, and another usually paler at the apex: under side black; legs testaceous, the thighs generally dusky in the middle.

Abundant during the autumn, in company with the Aphodiidæ and other coprophagous beetles.

S. marginátum.—Shining black, the margins of the thorax and of the elytra yellowish, legs ferruginous, the thighs with a band of black. 2–2¼.—*Fab.*

Considerably less than the preceding: shining black, minutely punctured: thorax yellowish on the outer margin: elytra likewise margined with yellow, the disk without spots, marked with a sutural stria as in the preceding: under side black; legs testaceous, with a black band across the thighs.

Found with the other species, but is rather scarce. Salisbury Craigs. Fields near Libberton.

FAMILY—ANISOTOMIDÆ.

GENUS—PHÁLACRUS, *Payk.*—Antennæ remote from each other at the base, rather slender, clavate, the club oblong, 3-jointed, the terminal joint oval or conic: maxillary palpi filiform, the terminal joint longest, cylindric-oval: maxillæ with the external process elongate, somewhat triangular, having a small horny claw internally: head triangular: body ovate, nearly hemispheric, not contractile into a ball: legs short, compressed, the tibiæ straight, without spines: tarsi with the penultimate joint bifid.—*Lat. Gen. Crust.* iii. 66.

This genus was instituted by Paykull, and adopted by Latreille. It was confounded by Fabricius with the genus *Sphæridium*, and was named *Anthribus* by Geoffroy and Olivier—*Anthribus* of Lat. being named *Macrocephalus* by the last named naturalist. Our present species are small, shining, hemispherical insects, frequently found on flowers. They pass the winter under moss or beneath the bark of trees, where they probably also undergo their metamorphosis. Their general colours are brown or black, their movements are rapid, and they are with difficulty seized or retained, on account of their smooth and polished surface.

P. corticális.—Oblong-ovate, pitchy-testaceous, with the head, thorax, and margins of the elytra of a darker hue, the elytra with two abbreviated striæ near the suture. 1–1¼.—*Illiger. Steph.*

Very glossy and smooth: head and thorax pitchy-black, scarcely perceptibly punctulated; the latter transverse, narrowed in front, where it is emarginate for the reception of the head, the sides narrowly margined: eyes black, antennæ reddish: elytra pitchy-testaceous, the suture and outer margins blackish, faintly punctulated, and impressed with two striæ near the suture which disappear anteriorly: under side and legs pale pitchy-testaceous.

"Ravelston Wood, under the bark of firs, in winter."—*Dr Leach. Steph. Illus.* ii. 161. It is very abundant near London, but becomes scarce in more northern countries. It is found in Germany, but has not been hitherto detected in Sweden.

P. rúfipes.—Rather short, ovate, testaceous-brown, the margin of the thorax, apex of the elytra, and antennæ, pale testaceous, legs rusty-red. ¾.—*Steph.*

"Short, ovate, shining testaceous-brown; head smooth, mouth concolorous: thorax pitchy-brown, with the margin pale rufo-testaceous: elytra short, broad, pitchy-brown, with the apex very pale testaceous, with a faint stria near the suture: body beneath and antennæ pale testaceous; legs rusty-red."—*Steph. Illus.* ii. 164.

Not possessing specimens of this species, we have extracted the above description from Stephens's Illustrations. The insect appears to be very scarce in Scotland, but a few examples have occurred near Cramond.

P. consímilis.—Ovate, rusty-brown, very glossy, antennæ, legs, and apex of the elytra ferruginous, elytra with a sutural stria, and a short obsolete one near the shoulder. ¾–1¼.—*Der. consimilis, Marsh.*

Head chesnut colour, the mouth pale testaceous, the eyes black; antennæ rufescent: thorax castaneous, smooth and very glossy, the margins more or less pale: elytra at the base scarcely wider than the thorax, a little narrowed behind, very convex, glossy castaneous, the apex ferruginous, each having a simple stria near the suture, and one or two very obsolete rudimentary ones near the shoulder: under side and legs ferruginous.

Var. *b.* Testaceous-brown, apex of the elytra, antennæ, and legs, pale testaceous.—*Ph. testaceus, Gyllen. Ph. geminus, Sturm. Steph.*

Inhabits the neighbourhood of Cramond, but is not common.

P. pulchéllus.—Raehills.—*Rev. W. Little.*

P. aéneus and P. ovatus have likewise been lately observed in the south of Scotland.

GENUS—EPHÍSTEMUS, *Steph.*—Antennæ approximating at the base, not very slender, the two basal joints robust, 3d shorter and more slender than the 2d, the five following globose, the rest forming a 3-jointed club, of which the terminal joint is obtuse: maxillary palpi with the basal joint robust, the terminal elongate, awl-shaped: mandibles entire at the apex: body elongate-ovate, acuminated at both ends: tarsi slender, the penultimate joint not bifid.—*Steph. Illus.* ii. 168.

E. gyrinóides.—Shining black, smooth, the antennæ and legs testaceous. ½.—*Der. Gyrinoides*, *Marsh.*

Very minute, shining black, smooth and impunctate; mouth and antennæ testaceous: anterior margin of the thorax slightly rufescent: elytra rather wide in front, attenuated to the apex, which is somewhat acute and obscurely piceous: under side black: legs pale testaceous.

Seemingly rare, although it may be presumed that it is often overlooked, owing to its diminutive size. Cramond.

GENUS—LEIÓDES, *Latreille.*—Antennæ longer than the head, clavate, 1st joint oval, 2d slender, 3d longest, subclavate, the three following equal, globose, the remaining five forming a pubescent club, of which the 2d joint is minute, the terminal large, subovate (Pl. I, fig. 14.): maxillary palpi with the 4th joint longest, subconic, the apex obtuse; labial with the two last joints of equal length, the terminal elongate-ovate; mandibles acute, one of them with a strong tooth: thorax convex, semiorbicular: posterior legs longer than the anterior, the tibiæ usually bent inwards: four anterior tarsi 5-jointed, terminal joint longest; the posterior pair 4-jointed, the last joint scarcely longer than the first.—*Curtis, B. E.* vi. 251. *Lat.* ii. 180.

Latreille was the first to form these insects into a distinct genus. They belong to his Heteromerous section, and had previously been confounded with the genus *Sphæridium*, which are pentamerous species. Illiger, being unacquainted with the labours of the French entomologist, had named the genus *Anisotoma*, and classed with it the *Phalacri* of Paykull, while Fabricius, under the same designation, combined Leiodes, Phalacrus, and Agathidium. The species of the genus, as now restricted, and above defined, occur among moss, in old walls, in rotten wood, beneath the bark of dead trees, and on mushrooms and other fungi.

L. aciculáta.—Ovate, head and thorax testaceous-red, impunctate, elytra somewhat castaneous, wrinkled across, and having a simple stria on each side of the suture. ½–¾.—*Anisotoma aciculata, Kunzé. Anis. spinipes? Gyllen.*

Considerably smaller than any of the following, short-ovate, glossy: head testaceous-red, with the eyes black; antennæ pale testaceous: thorax transverse, the sides rounded and very narrowly margined, the hinder angles obtuse, the colour like that of the head, and the surface scarcely or not at all punctulated: elytra very convex, of a darker hue than the thorax, approaching to chesnut, finely wrinkled across, impressed with a deep stria towards the suture, and having a few very obsolete rudimentary ones on the disk: under side and legs pale testaceous-red, the hinder thighs slightly dentate near the base.

Rare. Cramond.

L. castánea.—Oval, pitchy-black above, testaceous-red beneath, the elytra with irregular striæ somewhat arranged in pairs, the interstices punctulated. 1–1¼.—*Anis. castaneum, Gyllen.*

Shining, oval, rather attenuated behind: head faintly punctured, the mouth, upper lip, and palpi, testaceous-red; antennæ ferruginous, the club dusky: thorax very short, convex, the sides and angles somewhat rounded and margined, faintly punctured, glossy pitch-black, with the sides and hinder margin narrowly ferruginous: elytra very convex anteriorly, pitch-black or dark chesnut colour, the sides always rufescent; thickly punctured, the punctures very irregular, but having a tendency to run in lines which are indistinctly arranged in pairs, the interstices with minute punctures: under side and legs testaceous-red.

Far from common. It frequents parasitical fungi and putrescent wood. Rosslyn. Cramond.

L. thorácica.—Subglobose-ovate, head and thorax pitchy castaneous, very glossy and thickly punctulated, elytra chesnut red, punctate-striate, the interstices without punctures. 1–1¼.—*Steph. Illus.* ii, 174,

Short, somewhat globose: head and thorax pitchy-black, slightly castaneous, and extremely glossy, covered with very minute, obsolete punctures; antennæ ferruginous, the club obscure: scutellum the colour of the thorax: elytra chesnut colour, very convex, distinctly punctate-striate, the interstices flat or nearly so and impunctate: under side and legs pale ferruginous.

On wall-tops, trunks of trees, &c. Occasional throughout the Edinburgh district.

L. políta.—Subglobose-ovate, chesnut colour, elytra punctate-striate, the interstices with scattered punctures.—*Steph. Silpha polita, Marsh.*

Resembles the last in form and size, but usually of an uniform castaneous colour, the head and thorax sometimes a little darker than the elytra: thorax very glossy, minutely punctulated: elytra punctate-striate, the interstices somewhat elevated, and marked with a few scattered punctures: underside and legs pale testaceous; antennæ rather of a deeper red, with the club dusky.

Has been taken near Cramond, and elsewhere in the neighbourhood, but is very scarce.

L. testácea.—Subglobose-ovate, pale testaceous, elytra finely punctate-striate, the interstices flat and smooth. 1–1¼.—*Leiodes testaceus, Steph.*

Head finely punctured; eyes black; antennæ rufescent, with a dusky club: thorax punctured like the head, and glossy: elytra faintly punctate-striate, the interstices flat, and without punctures, the colour often a little deepened at the suture: under side and legs paler than the upper surface.

Not common: wall-top near Cramond.

L. ferrugínea.—Subglobose-ovate, ferruginous, elytra deeply punctate-striate, the interstices punctulated, and the alternate ones with a series of larger punctures. 1¼.—*Anis. ferrugineum, Fab. Gyllen.*

Head punctulated, ferruginous, the mouth and base of the antennæ paler, the apex of the latter dusky: thorax thickly punctured, very convex, the sides and hinder angles much rounded: elytra regularly and pretty deeply punctate-striate, all the interstices minutely punctulated, and the alternate ones impressed with a series of larger punctures: under side ferruginous; legs paler; the hinder thighs broad and compressed, the tibiæ armed with strong spines, the hinder pair slightly curved.

Found occasionally in woods, resting on piles of grass. Sand-bank by the side of the Esk, a little above Musselburgh.

L. arenária.—Globose-ovate, pale ferruginous, elytra punctate-striate, all the interstices finely and remotely punctured, the club of the antennæ dusky. 1¼.—*Wern. Trans.* vol. vi.

More globose than the preceding, pale ferruginous-red; head and thorax finely and thickly punctured, and very glossy: eyes black: antennæ pale rufo-testaceous, with the club dusky: elytra scarcely so deeply punctate-striate as in the preceding species, all the interstices finely and equally punctured; legs pale testaceous, the hinder tibiæ slightly curved.

Allied to *L. ferruginea*, from which it differs chiefly in having all the interstices between the striæ on the elytra finely and somewhat remotely punctured; the body more globose, and the legs of a paler hue.

This new species was taken in October 1830 on the top of a wall near Cramond Bridge.

L. pícea.—Short ovate, deep chesnut colour, thorax with a transverse row of large punctures at the hinder angles, elytra punctate-striate, all the interstices punctulated, the alternate ones with a few large punctures; the hinder tibiæ not elongate. 1¾–2¼.—*Steph.*

Deep chesnut colour, glossy: head covered with rather large punctures; eyes black; antennæ ferruginous, the club dusky: thorax punctured like the head, having a row of impressions along the margin at the hinder angles: elytra deeply punctate-striate, the interstices indistinctly punctulated, each alternate one with a few large punctures placed irregularly: under side piceous, somewhat castaneous, scarcely shining.

Rare in all parts of the country: Cramond. Woods at Rosslyn in November. "Luss in Scotland, beneath a stone," *Dr Leach.—Steph. Illus.*

L. humerális.—Nearly hemispheric, black above, ferruginous beneath, elytra with a broad quadrate red spot on each shoulder. 1½–1¾.—*Anis. humerale*, *Fab. Gyllen.*

Head shining black, smooth; mouth and palpi testaceous; antennæ ferruginous, with a dusky club: thorax with the sides rounded and slightly margined, the hinder angles obtuse; very convex, almost imperceptibly punctulated, glossy black, the sides and hinder angles ferruginous-translucent: elytra thickly punctulated throughout, and clothed with fine yellowish pubescence, having a few very obsolete and irregular striæ composed of larger punctures, the colour black, with a transvere quadrangular spot of red on each shoulder: under side pitchy-red, the abdomen pale: legs ferruginous, the thighs usually piceous.

Found on mushrooms (*Agarici*, *Boleti*, *Polypori*), but not frequently. Cramond, and woods at Dalmeny. Woods on the side of the road to Queensferry; *Hewitt C. Watson*, *Esq.*

L. litúra occurs in Dumfries-shire.

GENUS—AGATHÍDIUM, *Illiger.*—GLOBE BEETLE. Named from *ἀγαθὶς, a cluc*, because the species have the power of rolling themselves up into a ball.—Antennæ short, rather stout, with a 3-jointed, subovate club: maxillary palpi filiform, the terminal joint conic; labial palpi short and inconspicuous: maxillæ with the external lobe narrow, somewhat linear, the internal short acute: thorax transverse, large, the sides, as well as those of the elytra, bent inwards: body globose-hemispheric, contractile into a ball: legs short; tarsi generally 4-jointed, the penultimate joint not divided.—*Latr. Gen. Crust.* iii. 67.

Illiger constituted this genus by a dismemberment of the *Sphæridium* of Fabricius. All the tarsi have four articulations—a character which, according to the sectional system of Latreille, would place the species at a great distance from the genus just named, in which the articulations amount to five—and would also remove them widely from *Anisotoma*, in which the first four tarsi have five, and the last pair four, articulations. The insects of our present genus are of curious habits, and rather singularly organized. They occur in woods, beneath the bark of trees, and in mushrooms. When alarmed, they bend the abdomen towards the chest, and feign death in the most imperturbable manner. We regard the genus, of which about a dozen kinds occur in Britain, as characteristic rather of the north of Europe. It has been observed, that these insects sometimes bend both head and thorax under the elytra, so as to assume the appearance of shining globular pebbles *.

A. rúfipes.—Globose, shining black, punctulate, the sides of the thorax, antennæ and legs rufous. 1⅜.—*Wern. Trans.* vol. vi.

Globose, shining black, punctulate throughout: head black; palpi and antennæ ferruginous, the latter with the club dusky, excepting the tip of the terminal joint: thorax convex, glossy, and very finely punctulated, the disk black, the lateral margins much dilated, and widely rufous: elytra distinctly punctured, with a simple stria on each side of the suture, which disappears toward the base: under side piceous; legs rufous, the tarsi rather paler.

Closely allied to A. rufic**ó**lle and A. gl**ó**bus, but sufficiently distinguished from them by the black disk of the thorax, and by other characters.

Taken near Restalrig in the early part of the summer of 1831: we have not heard of its occurrence elsewhere.

A. átrum.—Shining black, very minutely punctulated, legs and antennæ pitchy-red, the scutellum large. 1–1¼.—*Anis. atrum*, *Payk. Gyllen.*

Head black, nearly smooth, the mouth obscurely testaceous; antennæ dusky testaceous: thorax greatly dilated on the sides, the hinder angles rounded, very convex, the punctures scarcely perceptible, shining black, the lateral and hinder margins often narrowly ferruginous-translucent: scutellum triangular, larger than in the other species: elytra very convex, globose, shining black, minutely punctured, with a single sutural stria, which is obsolete at the base: under side pitchy-black, punctulated; thighs of the same colour, tibiæ and tarsi pale ferruginous.

A species of not very unfrequent occurrence among moss, under stones, and the putrescent bark of trees. Woods at Craigmillar and at Cramond. Ravelston, &c.

A. nánum.—Nearly orbiculate, glossy black, the lateral edge of the thorax testaceous, legs black, elytra without a sutural stria. ½.—*Sam. Anis. punctulum*, *Gyllen.*

Head smooth, shining black, the mouth piceous; antennæ testaceous at the base, the club black: thorax not deeply emarginate in front, convex, smooth, the sides narrowly rufescent: elytra large, a little narrowed behind, smooth glossy black, the apex frequently ferruginous, without a stria near the suture: under side and legs blackish, the tarsi paler.

Under stones in mossy places, and on fungi, not common. Among dead leaves on Corstorphine Hill. "Edinburgh," *Dr Leach.*—*Steph. Illus.*

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* *Introduct. to Entomology*, vol. ii. p. 233.

SUBSECTION—NECROPHAGA.

The insects of this division are all more or less useful in freeing the surface of the earth from the remains of dead animals.

FAMILY—SCAPHIDIDÆ.

Genus—**CHOLÉVA**, *Lat*—Antennæ nearly filiform, about half the length of the body, the joints nearly equal, except the 2d and 8th, which are rather shortest, the five last forming an elongate club: maxillary palpi with the 2d and 3d joints nearly of equal length, and obconic, the terminal one conic, slender, and acute; labial with the terminal joint obtuse: thorax with the hinder angles obtuse: body clothed with fine silky pubescence, the elytra striated: legs very long, especially the hinder pair; the anterior tarsi with the three basal joints dilated in the males.—*Lat. Gen.* ii. 27. *Spence. Linn. Trans.* xi. 133.

The insects belonging to the genus *Choleva* of Latreille appear to have been described by previous writers under the genera *Mordella*, *Dermestes*, or *Tritoma*. Between the years 1796 and 1800, four entomologists, Latreille, Illiger, Paykull, and Frölick, recognised their claims to distinction, and named them accordingly—each, however, in ignorance of the other's intention, making use of a different generic appellation. Of these, Latreille's being the first in date, has been adopted by Mr Spence in his excellent "Monograph of the genus *Choleva* *," of which we have availed ourselves in drawing up the following descriptions. He there gives the characters of eighteen British species, arranged in three sections, of which some of the constituent parts are referable to the genus *Ptomaphagus* of Illiger and Knoch, to *Luperus* of Frolick, and *Catops* of Fabricius and Paykull. Only two of Mr Spence's species belong to the genus *Choleva*, in its present restricted form, as above defined.

C. angustáta.—Oblong, narrow, brownish-black, clothed with obscure yellowish pubescence, antennæ and legs ferruginous; thorax of equal width before and behind. 2½ : ¾.—*Cistela angustata, Fab. Chol. oblonga, Spence.*

Head black, smooth and shining: palpi and antennæ ferruginous: thorax rather flat, the base and apex nearly of equal width, or the latter rather widest, the sides rounded, and the hinder angles rounded, the colour pitch-black, with the margins paler: elytra dull reddish, black or pitchy, with seven obsolete striæ on each, that next the suture deepest; elongate and attenuated to the apex, which is obtusely rounded: under side black, nearly smooth, the terminal segment ferruginous: legs ferruginous, very long and slender, the hinder pair being as long as the body, the posterior trochanters in the male with a curved tooth projecting from the under side.

Under stones in woods, and among moss at the roots of trees, frequent. Woods at Dreghorn, Corstorphine Hill, &c.

Subgenus—**PTOMÁPHAGUS**, *Illig.* Name composed of two Greek words, *πτῶμα, a carcass*, and *φαγω, I eat.*—Antennæ clavate, scarcely half the length of the body, the club 5-jointed: palpi as in the preceding genus: thorax with the hinder angles acute: elytra without striæ: anterior thighs alike in both sexes; intermediate tarsi rarely with the basal joint dilatéd.

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* *Linnean Trans.* vol. xi.

P. truncátus.—Oblong-quadrate, brownish-black, clothed with fine pubescence, thorax widest behind, elytra rather obliquely truncated at the apex. ¾–1½ : ½–¾.—*Illig.* *Choleva villosa, Spence.* *Mordella silphoides, Marsh.*

Brownish-black, the elytra pitchy, reddish-brown, or testaceous, clothed throughout with very short fine pubescence, beneath which the surface is covered with very fine cross lines, which run into each other, and appear as if scratched with the point of a needle: head wide and convex, nearly smooth; antennæ blackish, with the base ferruginous; palpi ferruginous, sometimes blackish: thorax rather wider than long, convex, the basal line straight, with a slight excision at each of the basal angles: elytra distinctly and somewhat obliquely scratched across, rather narrower than the thorax, and about thrice its length, the sides nearly straight, or very slightly narrowed from the base to the apex, which is obliquely truncate, with the exterior angles rounded; each having a simple stria on the sutural and lateral margins: under side pitch-brown, punctulated: legs black, the tibiæ and tarsi generally pitchy or obscurely testaceous.

Frequent on dead animals, decaying vegetables, &c.

P. anisotomóides.—Oval, convex, glossy brownish-black, antennæ and legs pale ferruginous, thorax with the basal margin straight. ⅜ : ½.—*Choleva anisotomoides, Spence.*

More convex than the other species of the genus, pitchy-brown, clothed with rather coarse pubescence: head nearly smooth; antennæ pale yellowish; palpi ferruginous: thorax narrowed in front, nearly one-half wider than long, the hinder margin straight, and usually of a paler hue than the rest: elytra one-half longer than the thorax, and rather wider, ovate and convex: legs pale testaceous.

Var. b. Entirely pale testaceous.

"The most distinguishing characteristics of this species are the straightly truncate hinder margin of the thorax, and the more than ordinary convexity of the body, which is such as to give it in some degree the habit of an *Anisotoma* or *Phalacrus.* The antennæ are almost capitato-clavate; the first two joints seem distinctly longer than the third; and the eighth is obviously less than the seventh and ninth. The pubescence approaches more to the character of pili than in the other species."—*Spence.*

P. velox and *P. fumatus* are Scotch species, examples having occurred in the neighbourhood of Annan.

SUBGENUS—CÁTOPS, *Payk.*—Antennæ and palpi as in the preceding subgenus: thorax with the hinder angles acute: elytra more or less evidently striated: anterior thighs in the male generally somewhat thickened at the apex; the intermediate tarsi with the basal joint dilated.

C. fornicátus.—Oblong-oval, black, antennæ rather longer than the thorax, and, together with the legs, of a ferruginous colour. 2½ : 1¼.—*Dermes. fornicatus, De Geer.* *Choleva nigricans, Spence.*

Body oblong, black, clothed with griseous-yellow pubescence, the surface appearing somewhat rough when the down is rubbed off: head minutely and closely punctulated: palpi and antennæ ferruginous, the apex of the latter somewhat dusky: thorax nearly square, rather wider than long, the basal line a little arched in the middle, and a small excision at each of the hinder angles: elytra wider than the thorax, and more than twice its length, considerably arched lengthwise, and marked with obsolete striæ which extend the whole length: under side pitch-black, thickly punctured, and pubescent; legs ferruginous.

Var. b. Testaceous-yellow, with the head dusky; perhaps recently transformed.

Of not unfrequent occurrence in this neighbourhood, and throughout the south of Scotland. Duddingston. Among moss in woods near Dreghorn.

C. trístis.—Oblong-oval, black, antennæ the length of the thorax, having their base, together with the tibiæ and tarsi, ferruginous. 1¾–2 : 1¼. —*Choleva tristis, Lat. Spence. Mord. clavicornis, Marsh. Chol. clavicornis, Steph. Illus.*

Broader in proportion to its length than the preceding, but in other respects similar in form: black, clothed with yellowish pubescence, having a fine silky gloss: head very short before the insertion of the antennæ; the latter with the 4–6 lowest joints ferruginous, the remainder dusky black; palpi ferruginous: thorax nearly of equal breadth at the base and apex, the sides slightly rounded, the basal angles acute, and very slightly prominent: elytra scarcely wider than the thorax, and more than twice its length, marked throughout their whole length with very obsolete striæ: under side pitch-black; thighs usually pitch-brown, the tibiæ and tarsi ferruginous.

Under stones and decaying animal matter, occasional.

C. Leáchii.—Oval, black, the base of the antennæ, the tibiæ, and the tarsi, reddish-brown; antennæ clavate, the terminal joint short and pointed. 2¼ : 1¼.—*Choleva Leachii, Spence.*

Clothed with a dense griseous-yellow pubescence, beneath which the surface is very obsoletely rugose-punctate: head very minutely punctured, short before the antennæ; palpi brownish; antennæ reddish-brown at the base, fuscous at the apex, the six uppermost joints somewhat cup-shaped, the terminal one globose-ovate and terminating in a point: thorax nearly square, wider than long, the sides rounded and the basal margin nearly straight: elytra very obsoletely striated, the striæ scarcely perceptible except when the pubescence is rubbed off; legs pitch-black, the tibiæ and tarsi reddish-brown.

Seemingly not common. A few individuals have been taken at Hunter's Tryst in the month of June.

C. Kírbii.—Obovate, fuscous, with the legs paler, antennæ ferruginous at the base, the terminal joints transverse; elytra with the apex acute. 1⅞ : 1.—*Chol. Kirbii, Spence.*

Of a fuscous colour, and clothed with griseous pubescence: palpi and five lowest joints of the antennæ ferruginous: thorax rounded on the sides, but nearly straight at the hinder angles which are without an excavation on the basal margin: elytra rather wider in the middle than the thorax, the apex more acute than the other species, the surface not marked with any perceptible striæ: legs paler than the upper surface.

This species has occurred by the side of Braid Burn; but it is rare.

FAMILY—SILPHIDÆ.

This family presents the typical or characteristic forms of the necrophagous species. Their larvæ inhabit dead carcasses, and are found in company with the perfect insects. They are of active habits, and are converted into pupæ under ground.

Genus—NECRÓPHORUS, *Fab.*—Burying-beetle. From *νεκρος*, *a carcass*, and *φορεω*, *I carry.*—Antennæ scarcely longer than the head, capitate, apparently 10-jointed, 1st joint long, clavate, 2d longer than any of the four following, which are subglobose, the four last forming a perfoliate club (Pl. 1. fig. 15.): palpi with the terminal joint cylindric truncate, the two preceding clavate truncate: mandibles standing out from the head, without teeth: head rather large, united to the thorax by a short neck: thorax quadrate-orbicular: elytra elongate-quadrate, leaving three or four of the abdominal segments exposed: tibiæ short and strong, widening gradually to the apex, where they are armed with two long spines: anterior tarsi of the males dilated and fringed with long hairs.—*Lat. Gen. Crust.* ii. 4. *Curtis, B. E.* ii. 71.

This important and well-marked genus was first defined by Fabricius. Linnæus had placed the species of which it is composed with the Silphæ, while Scopoli and Geoffroy combined them with the genus Dermestes. The most marked peculiarity in their manners consists in their habit of interring small animals, such as mice and moles, for the purpose of depositing their eggs in the decaying carcass. To effect this operation, they remove the earth from beneath the dead body, which sinks into the hollow, and is afterwards covered with the looser soil of the excavation. Their sense of smell, like that of many other insects, is extremely delicate, and no sooner has any of the smaller quadrupeds perished, than one or more of these grave-diggers make their appearance, and in a few hours the corpse is interred. The larvæ are of a lengthened form, of a greyish white colour, with a brown head; their bodies are composed of twelve rings, furnished on their anterior and superior portion with a small scaly plate or shield, of a ferruginous-brown colour; those of the last segments are provided with small elevated points. The head is hard, scaly, and provided with strong cutting mandibles. The feet are six in number, very short, and attached to the first three segments of the body. When these larvæ have attained to their final term of increase, they descend, it is said, fully a foot beneath the surface, and forming an oval chamber, the walls of which are strengthened by a coating of a gluey liquid, they assume the nympha state. The perfect insect makes its appearance in the course of three or four weeks. There are about seven species of this genus in Britain. They are all of considerable size.

N. Humátor.—Black shining, club of the antennæ ferruginous. 8–13: 4–5½.—*Silpha Humator, Oliv. Marsh. Don.*

Entirely shining black, brownish when immature, the three last joints of the antennæ orange-colour; palpi pitchy-red: head obsoletely punctulated, with a semicircular impressed line across the crown, the ends of which are continued down the inner side of each eye: thorax quadrate-orbicular, widest in front, obsoletely punctulated; the disk rather elevated, with a longitudinal line in the centre, and a transverse impression anteriorly, dividing the space before it into four lobes; the hinder margin flat and distinctly punctured: scutellum punctured: elytra covered with pretty large punctures, the disk of each with three longitudinal lines, the two next the suture approximating at the base, the 3d diverging; the space between the 2d and 3d line elevated at both extremities, making the shoulders somewhat prominent, and forming a tubercular elevation towards the external apical angle: breast clothed with yellowish hairs: segments of the abdomen fringed with hairs: legs black, ciliæ of the tarsi golden yellow.

Under dead animals, rather of more frequent occurrence than the following species.

N. vestigátor.—Black, the club of the antennæ, external margin of the elytra, and two transverse bands, orange-yellow. 7–9: 3½–4½.—*Herschel, Magazin fur Insectenkunde*, v. 6. p. 274.

Glabrous, black, head quadrate behind, with an arched impression between the eyes and a faint central line; the three terminal joints of the antennæ and tips of the palpi orange-yellow: thorax in shape and sculpture nearly as in the preceding species, the disk not so convex, the impressions rather deeper: elytra punctate, with three indistinct longitudinal lines, the shoulders prominent, the apical tubercle rather obsolete; the outer margin and two transverse bands orange-yellow, the anterior band broadest and dentate on the edges, the posterior lying along the apical margin for half its length, the remaining portion somewhat remote from the margin, and not reaching quite to the suture: breast covered with golden yellow hairs; abdomen and legs shining black, the tarsi with yellow ciliæ.

Considerably more common than either of the following species. Found under carcasses, and occasionally on fungi.

N. mortuórum.—Black, glabrous above, elytra with a transverse band, a rounded spot at the apex, and a mark on the under side of the shoulder, orange-yellow. 6–7: 3–3¼.—*Fab. Silpha Mortuorum, Don.* xv. pl. 537. f. 2.

Head, antennæ, and thorax entirely black, sculptured nearly as in the preceding species, but the head without a central channel: elytra with a broad, dentate orange band anteriorly, and a large central spot of the same colour at the apex of each elytron, rounded on the hinder side, and having a projecting point anteriorly; there is likewise a small orange spot beneath the shoulder, sometimes united to the transverse band by a narrow streak of yellow running along the external margin: breast with yellow hairs: abdomen and legs black.

In such places as the preceding, not very common.

N. Vespíllo.—Black, the club of the antennæ and two bands across the elytra orange-yellow, the hinder trochanters elongated into an acute spine. 6–11.—*Herschel. Lat. Steph.*

Head black, with a triangular yellow spot in front; antennæ black, the apex orange-colour: thorax shaped and sculptured nearly as in the preceding species, but differs from them all in being clothed anteriorly with golden-yellow hairs: elytra likewise pubescent, with the external margin and two cross bands of an orange colour, the anterior band widest: hinder tibiæ elongate and considerably curved, the trochanters long and forming an acute spine.

Not very common in Scotland.

GENUS — NECRÓDES, *Wilkin.* Named from *νεκρώδης, cadaverous.* — Antennæ shorter than the thorax, thickening gradually from the 5th joint to the apex, 1st joint longest, robust, 2d and 3d elongate-obovate, the three following somewhat globose, the rest compressed and transverse, the last subovate: maxillary palpi with the last joint elongate-oval, the two preceding clavate-truncate; labial with the two terminal joints ovate; mandibles with a tooth near the middle: body elongate-oval: thorax orbicular: elytra obliquely truncate at the apex: anterior legs short: the hinder thighs much thickened in the males; the four anterior tarsi with all the joints except the terminal one dilated and heart-shaped.—*Curtis, B. E.* vii. 334. *Leach. Zool. Mis.* iii. 74.

N. littorális.—Oblong, depressed, black; three terminal joints of the antennæ orange yellow. 7–11.—*Silpha littoralis, Linn. Marsh.*

Wholly black, with the three terminal joints of the antennæ orange: head and thorax glossy, finely punctulated, the latter with a very faint dorsal channel, and several impressions towards the base, variable in shape, and often obsolete: scutellum large, triangular, punctured: elytra dull black, very thickly punctured; with the sutural margin and three elevated lines on each smooth and shining, the 2d angulated a little behind the middle, where it is connected to the 3d by a tubercle: posterior thighs greatly thickened, and denticulated beneath in the males; those of the female simple.

Found on the shores of the sea, and the banks of rivers, under carrion, sea weed, &c., but not common. Shore at Newhaven.

GENUS—OICEÓPTOMA, *Leach.* From *οικέω to inhabit*, and *πτῶμα a carcass.*—Antennæ shorter than the thorax, abruptly clavate from the 7th joint; 1st joint long, robust, 2d and 3d elongate-ovate, the four following somewhat globose, the next cup-shaped, forming the base of the club: maxillary palpi with the terminal joint elongate-ovate, the two preceding clavate truncate: body oval, depressed: thorax transverse, nearly semicircular, emarginate in front: elytra depressed, covering the abdomen, the apex rounded and entire, (sometimes emarginate in the female); legs slender, the anterior tarsi slightly dilated.—*Leach. Zool. Mis.* iii. 74.

O. thorácica.—Ovate, depressed, black, with a silky gloss, the thorax rufous. 6–7 : 3¼–4.—*Silpha thoracica, Linn. Marsh.*

Head black, punctulated, somewhat pubescent on the crown: antennæ and palpi black, the tips of the latter sometimes ferruginous: thorax thickly punctulated, covered with very short silky rufous shining hairs, the disk convex and foveolated, the sides depressed and much dilated, the hinder angles rounded: elytra rather obscure black, punctulated and unequal, with a very short silky pubescence, the sides widely depressed, and inflected beneath, the apex rounded, slightly acuminated at the suture in the male; the disk of each with three longitudinal lines, the two next the suture inconspicuous, the outermost elevated, carinated, and terminating a little behind the middle in a large transverse tubercle, beyond which the central line is carinated and oblique: under side of the body and legs black, punctulated, somewhat shining.

On carcasses, not common in the Edinburgh district, but more frequent a little to the south.

O. rugósa.—Ovate, depressed, black, pubescent, thorax tuberculated, elytra with three longitudinal lines, the spaces between with transverse tubercles. 4–5 : 2¼–2½.—*Silpha rugosa, Linn.* Marsh. Gyllen.

Head short, punctulated, black, densely pubescent: antennæ and trophi black: thorax with the sides and angles rounded, sinuated behind, the surface slightly convex, punctulated and clothed with short greyish hairs, leaving numerous, very slightly elevated, glabrous tubercles: elytra obscure black, minutely punctured, the lateral margins inflected, the apex obtusely rounded; each with three slightly flexuose lines, the outer one most elevated, the interstices rugose, with irregular transverse tubercles, which are somewhat shining, and often united to the longitudinal lines; the central line with a small tubercle behind the middle: under side and legs black, pubescent, the terminal segment of the abdomen rufescent at the tip.

On decaying animal matter, plentiful.

O. sinuáta has occurred once or twice in Dumfries-shire, but seems to be rare in Scotland, although said to be plentiful in many parts of England.

GENUS—SÍLPHA*, *Linn.*—Antennæ thickening gradually from the 7th joint to the apex, and slightly compressed, the three lowest joints as in the last genus, 4th, 5th, and 6th rather short, ovate-truncate, 7th cup-shaped, 3 following transverse, terminal large-subovate: palpi not differing materially from those of *Oiceoptoma:* body oval, more or less convex: thorax semicircular, truncate in front; elytra entire: legs rather short, the tarsi of the fore-pair dilated in the males.—*Leach. Zool. Mis.* iii. 74.

This genus, originally of great extent, has been much modified and circumscribed by De Geer, Fabricius, Latreille, Leach, and others. The species which it now contains, resemble their congeners in being of an essentially carnivorous nature, preferring animal substances in a state of putrescence to fresher food. They exhale a disagreeable odour, and when seized, a thick and dark coloured liquid exudes from their bodies. The larvæ resemble the perfect insects in their habits. They consist of twelve segments, of which the sides are terminated by sharp angles, the terminal segment being furnished with two conical appendages: the head is small, and bears a pair of tri-articulate filiform antennæ, and two strong maxillæ. Like the preceding genus they undergo their metamorphoses under ground. The species are pretty extensively distributed over the earth, and are rather numerous. De Jean enumerates twenty-seven species in his *Catalogue*, which, however, includes under the generic name of Silpha the genera *Oiceoptoma* and *Phosphuga* of Dr Leach. Of the restricted genus we have not more than eight British species.

S. quadripunctáta.—Black, glabrous, the margins of the thorax and the elytra pale yellowish, the latter with two round black spots on each. 5–6½.—*Linn. Don. Marsh. Silpha 4-maculata, Samou. Comp.* pl. 2. f. 7.

Head wide and unequal on the surface, shining black and finely punctured: antennæ black: thorax with the flat dilated sides pale yellowish, the disk black, convex, and marked with several shallow foveolæ, the front and base narrowly margined with yellow: elytra thickly punctured, pale testaceous, shining, with two rounded black spots on each, one of an ovate form on the shoulder, and another, which is rounded, a little behind the middle; each with three elevated lines not reaching to the apex, the external one conspicuous, the other two obsolete: under side and legs black and punctured.

This finely marked species is very scarce in Scotland. Mr Wilson took specimens several years ago near Currie, and others have been recently procured from the vicinity of Loch Tay, where they were found by Dr Greville. The insect is more common in England, where it frequents oak woods, for the purpose of feeding on the larvæ of the Lepidoptera, which usually abound in such situations.

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* The word *Silpha*, derived from a Hebrew root, occurs in Aristotle, and appears to have *been sometimes used* by that author to signify a cockroach.

S. obscúra.—Dull black, deeply punctured, the three elevated lines on the disk of the elytra obsolete. 6–7.—*Linn.* *Gyllen.* *Don.* ii. pl. 63. f. 4.

Dull black above, somewhat shining beneath: head thickly punctulated, with an obsolete ridge across the crown; tips of the palpi and the fringe of hairs on the margin of the upper lip, reddish-brown; antennæ black, slightly pubescent: thorax large, sometimes rather wider than the elytra, the front and sides margined, the surface a little convex, equal or nearly so, and very thickly covered with round punctures: elytra with a reflexed margin, somewhat convex, having three faint longitudinal lines, the spaces between which are less thickly, but more deeply, punctured than the thorax, the punctures forming a pretty regular stria on each side of the elevated lines; the outer margin more thickly punctate: under side and legs finely punctulated, black, slightly shining.

Rather scarce, but found occasionally by road sides, in fields and woods.

S. trístis.—Rather dull black, elytra very finely punctured, having three conspicuous elevated lines, and an obsolete tubercle behind the middle. 5–7.—*Illig.* *Gyllen.* *Silpha recta, Marsh.*

More oblong and convex than the preceding, head and antennæ similar, the thorax not so thickly punctured, and rather shining, the disk convex, and obsoletely foveolated, the sides and hinder margin somewhat depressed: elytra with an elevated margin and three conspicuous polished lines on each, the external one rather shortest, having a distinct, though somewhat obsolete, tubercle, behind the middle, the interstices closely and finely punctured: under side and legs black, slightly shining, punctulated.

Occurs in such situations as the preceding, but is equally scarce.

S. nígrita.—Black, somewhat shining, elytra with three obsolete abbreviated lines, the intermediate spaces thickly and deeply punctured. 5½–6½.—*Creutzer.* *Steph.*

Deep black, glossy: head punctured; palpi and antennæ likewise black: thorax covered with minute punctures, channelled down the middle, and having a large shallow arched impression on each side: elytra not very convex, the three longitudinal lines not extending to the apex, and nearly effaced, the spaces between and the apex covered with rather large and pretty deep punctures, which run into one another, and give the surface a somewhat rugose appearance: under side and legs black.

Not common: Pentland Hills. It is not unfrequent in many of the hilly districts of Scotland. "Arbroath."—*Steph. Illus.*

S. opáca.—Subdepressed, clothed with short brownish hairs, elytra with three elevated lines, the outermost terminated by a tubercle. 4½–5. —*Linn.* *Fab.* *Silpha tomentosa, De Geer.* *Marsh.*

Smaller than any of the preceding, and covered with brownish, or shining yellowish-brown hairs: head thickly punctured; antennæ black: thorax with three slight sinuosities behind, the centre somewhat convex, and rather unequal, the sides depressed and margined, the whole surface closely punctured and pubescent: elytra scantily pubescent, very thickly punctured, with three smooth longitudinal lines, the central one longest, the outermost carinated, and terminating in a tubercle a little behind the middle: under side and legs shining black, thinly pubescent.

Not common, but occurring now and then on pathways, and in woods. Blackford Hill. Woods at Dreghorn.

GENUS—PHÓSPHUGA, *Leach.* Probably from *φως*, *light*, and *φεύγω*, *to flee.*—Antennæ rather long and slender, not compressed, with the three last joints abruptly thickened; 1st joint longest, clavate, 3 following obconic, next 4 short subglobose, 3 last thickened, globose-ovate, terminal ovate: maxillary palpi with the two last joints of equal length, terminal subovate: mandibles incurved at the apex, and very acute, with a long rounded tooth before the middle: body oval or somewhat rounded: thorax semicircular: elytra covering the abdomen, and not emarginate at the apex: legs slender, the anterior tarsi dilated in the males.—*Leach.* *Zool. Mis.* iii. 74.

P. atráta.—Shining black, rather convex, elytra ruggedly punctate, with three elevated lines on each, not reaching to the apex. 5–5¾ : 2¾–3. —*Silpha atrata*, *Linn.* *Marsh.*

Black, somewhat shining, glabrous; head narrow, elongate, punctured; antennæ black, pubescent, the tips of the palpi ferruginous: thorax forming a nearly perfect semicircle, the front scarcely obtuse, and the base almost straight, the front and sides margined, the disk rather unequal, and the whole surface thickly punctured: elytra with the margin much reflexed anteriorly, the disk pretty convex, rugosely punctured, with three smooth elevated lines disappearing a little behind the middle: under side and legs black, punctulated and sparingly pubescent.

Var. b. Black, the thorax and elytra reddish-brown; the disk of the thorax sometimes black.

Common in woods and fields; towards the end of the autumn, and in winter, found under moss, dead leaves, and stones. The variety mentioned is not common, but occurs at times among the Pentland Hills.

FAMILY—NITIDULIDÆ.

GENUS—NITÍDULA, *Linné.* The name appears to be a diminutive from nitidus, *shining.*—Antennæ short, abruptly clavate; the radical joint large, thick and somewhat orbicular, the 3d above one-half longer than the 4th, the three last forming a club, which is compressed and perfoliate, (Pl. I. fig. 16.): maxillary palpi short and filiform: thorax somewhat dilated on the sides and deeply margined, rather narrowest anteriorly, where it is slightly emarginate, the hinder angles acute: elytra rather wider than the thorax, generally covering the extremity of the abdomen, but sometimes truncate; more or less punctured, but never regularly striated: anterior tibiæ broad, elongate triangular; tarsi with the third joint bifid, the following one inconspicuous.—*Lat. Gen.* ii. 10.

The species of which Fabricius formed this genus, were arranged among the Silphæ by De Geer and Linnæus. The name which they now bear is by no means applicable to creatures of so obscure an aspect. On this account Leicharting changed the term to Ostuma, but he has not been followed in that alteration. The Nitidulæ are found on animal remains, on fungi, beneath the bark of trees, beside the liquid which exudes from the rents in timber, and occasionally on flowers. The larvæ are very similar to those of the Silphæ, and undergo their transformations under ground. The *species* are rather numerous, and may be regarded as characteristic of

European countries, although a few are exotic. Britain produces about twenty-five species.

N. grísea.—Oblong-ovate, griseo-ferruginous, thorax foveolated, elytra lined and spotted with black. 1½–2.—*Marsh. Silpha grisea, Linn. Nit. varia, Fab. Gyllen.*

Oblong-ovate, not very convex; head ferruginous, punctured and unequal; eyes black and prominent; antennæ ferruginous, with the club dusky: thorax short, widely emarginate in front; broader behind, the sides depressed and dilated, the disk rather convex and obsoletely foveolated, of a griseo-ferruginous colour, irregularly marked with black, and having a few scattered hairs: elytra with a few elevated lines, griseo-testaceous, marked with longitudinal linear spots of black, which unite into a pretty large spot on the back behind the middle: under side pitchy black, the apex of the abdomen paler; legs pale ferruginous.

Not common. On a wall top under trees, near Ravelston. Cramond.

N. cólon.—Ovate, dusky black, the sides of the thorax, several small spots towards the base of the elytra and a large one on the apex, ferruginous; the thorax with two foveolæ on the disk. 1½–1⅔.—*Fab. Marsh. Silpha Colon, Linn.*

Head smooth, thickly punctured, black, with the mouth piceous; antennæ ferruginous, the club black; thorax shaped nearly as in the last, the angles acute, the disk somewhat elevated, blackish and impressed with two shallow foveolæ rather behind the middle, the sides ferruginous: elytra very sparingly pubescent, dusky black, with obscure ferruginous spots anteriorly, the apex with a large ferruginous patch, usually interrupted by a waved streak of black reaching nearly to the suture; each elytron with a stria at the suture, and a few very obsolete rudimentary ones externally: under side black: legs dull ferruginous.

On decaying animal matter, sometimes under the bark of trees, occurring at times in considerable abundance.

N. discóidea.—Ovate, dusky-black, sides of the thorax and disk of the elytra pale testaceous; the thorax with two foveolæ on the disk. 1½.—*Fab. Marsh. Samou. Comp.* pl. 2. f. 5.

Elytra finely punctulated, with griseous pubescence, the anterior portion of the disk entirely pale testaceous, the sides narrowly black, the apex more widely, and having a bent row of pale coloured spots: in other respects scarcely differing from *N. colon.*

In such situations as the foregoing, not frequent.

N. bipustuláta.—Ovate, rather dull black, with a round red spot on the middle of each elytron. 1¾–2½.—*Marsh. Silpha 2-pustulata, Linn.*

Finely punctulated, pubescent; head, antennæ, and thorax entirely black, rather dull, the latter very little emarginate in front, somewhat convex, the surface equal: elytra black, slightly shining, with a rounded spot of red in the middle towards the suture, the sides margined, the apex very obtuse, almost truncate, and not quite covering the abdomen: under side black, pubescent; legs dark red.

On carcasses frequent, particularly on the shores of the Firth: sometimes on putrescent vegetables and Boleti.

N. oblónga.—Oblong ovate, depressed, dark ferruginous, with the club of the antennæ black, thorax emarginate in front, the elytra truncate at the apex. 1¼—1½.—*Herbst. Gyllen. Steph.*

Rather long, much depressed, and very thickly punctured, of a dusky ferruginous colour, with the eyes and the oblong club of the antennæ black; thorax scarcely one half wider than long, the front emarginate, and the sides rounded; the disk dusky ferruginous, the lateral margins pale; elytra rather long and somewhat linear, the apex truncate: the surface thickly punctured and slightly pubescent, the outer margin of a paler hue than the rest: under side pitch black: legs dull testaceous.

On the flowers of the Spear Thistle (*Cnicus lanceolatus*), and other plants, generally rather scarce, although we have sometimes met with it in great plenty.

N. obsoléta.—Ovate, depressed, ferruginous, thorax deeply emarginate in front, elytra truncate at the apex. 1½.—*Illiger. Gyllen. Steph.*

Wider and of a paler colour than the preceding; ferruginous inclining to testaceous, ovate, depressed, and thinly covered with fine short pubescence: eyes black, the club of the antennæ dusky: thorax widely and deeply emarginate in front, the sides considerably rounded, but not very widely dilated, the disk rather convex: elytra wide, truncate at the apex, where the angles are rounded, the disk somewhat convex, and having an impression on the back before the middle: under side ferruginous, punctured; legs pale testaceous.

Var. b. Pale testaceous, elytra obscure, having a pale spot near the apex of each, and a pale line anteriorly within the margin.

Under the bark of trees, and on flowers, not unfrequent. There are several varieties, none of which, however, have been observed in this neighbourhood, except the one specified, which was once taken in considerable numbers feeding on Boleti and Polypori in Duddingston Wood.

N. impréssa.—Ovate, slightly convex, of a testaceous yellow colour, the suture dusky or black. 1¼–1½.—*Steph.*

Not very convex, rather short ovate, yellowish, minutely punctured and finely pubescent: head with an impression in the middle anteriorly; eyes black, tip of the antennæ usually somewhat dusky: thorax not so deeply emarginate in front as in the last species, the sides equally rounded: elytra wide, the apex nearly as in *N. obsoleta*, the suture dusky or black; under side testaceous yellow: legs pale.

On plants and under bark of trees, occasional.

N. decemguttáta.—Oblong-ovate, dusky ferruginous, each elytron with five pale spots. 1¼–1¾.—*Fab. Marsh. Gyllen.*

Head unequal, deeply punctured, dusky ferruginous, eyes black; antennæ wholly ferruginous: thorax widely emarginate in front, thickly punctured and subpubescent, the disk of the same colour as the head, the sides, and a spot near the base, which is prolonged anteriorly, paler: elytra obtuse at the apex, with both the external and sutural angles rounded, moderately convex above, closely punctured, somewhat pubescent, dark ferruginous, with two pale spots at the base of each, another of an angular form near the middle of the lateral margin, a fourth placed obliquely near the suture behind the middle, and a fifth near the apex often united to the lateral spot: under side dark ferruginous: legs pale testaceous.

Rare. Under the bark of trees near Cramond.—The other Scotch species are *N. depréssa* and *N. punctatíssima.* The latter has occurred in considerable numbers in the neighbourhood of Hawick and Jedburgh, and other parts of the south of Scotland.

GENUS—STRÓNGYLUS, *Herbst.*—Antennæ a little longer than the *head, capitate,* radical joint oblong, more robust than the following, which diminish in length to the 8th, the three last forming a thick pubescent club, of which the two first joints are cup-shaped, and the terminal one mamillate: maxillary palpus with the terminal joint nearly as long as the three lowest ones: head wide: thorax broad and convex, the sides not depressed: elytra with the apex rounded and covering the abdomen; tarsi with the three basal joints dilated, 4th minute, 5th or terminal as long as the others united, clavate.—*Curtis, B. E.* viii. 339.

S. ferrugíneus.—Ovate, dark ferruginous, pubescent, elytra deeply punctate-striate. 2¼.—*Nitid. ferruginea, Fab. Nitid. fulva, Marsh.*

Of a deep ferruginous colour, covered with hairs: eyes black and prominent; antennæ ferruginous, the club fuscous: thorax short and wide, the sides rounded and narrowly margined, the disk convex and marked with rather large obsolete punctures: elytra rather convex, the sides widely margined, the apex obtusely rounded, each with nine rows of large punctures, and a series of hairs between them: under side ferruginous, punctured: legs short and thick, ferruginous.

Inhabits various kinds of fungi, particularly those belonging to the genus *Lycoperdon*, or Puff Ball, but is rare in Scotland. Near Ravelston. Cramond.

S. férvidus has been found in the vicinity of the Annan in Dumfriesshire; and *S. lúteus*, which forms the genus *Cychramus* of Kugellan and *Campta* of Kirby, has occurred in the same locality. The latter differs from the true *Strongyli* in having the antennæ slender, and the terminal joint not mamillate.

GENUS—MELIGETHES, *Kirby*. From *μελι, honey*, and *γηθεω to delight in*, the species being usually found on the blossoms of plants, from which they extract the honey.—Antennæ about the length of the thorax, clavate; the radical joint large, 2d very short, 3d nearly as long as the two following united, next three transverse, the remaining three forming a compressed club: palpi short and filiform, the terminal joint longest: thorax large and wide, the sides rounded and not depressed: elytra usually truncate at the apex: body ovate-quadrate: legs short and stout.

M. rúfipes.—Short, convex, very thickly punctulated, rather obscure black, clothed with yellowish silky pubescence, base of the antennæ and legs testaceous. 1½–1¾.—*Steph. Nit. rufipes, Marsh. Silpha rufipes, Linn.*

Considerably larger than any of the following species: the upper surface rather obscure black, very thickly punctulated, and clothed with short silky hairs of a yellowish colour in certain lights: mouth pitchy-red, the base of the antennæ ferruginous, the club black: thorax large, convex, very slightly emarginate in front, the sides narrowly margined: scutellum nearly semicircular: elytra convex, margined on the sides, the apex obtuse, very closely punctulated, when seen obliquely appearing transversely wrinkled: under side black, pubescent: legs testaceous.

Var. b. Black, with the anterior legs testaceous-red.—*M. flavimanus, Kirby.*

On plants, not common in this neighbourhood. It is rather more frequent in Roxburghshire, but appears to be somewhat scarce in all parts of the country.

M. aéneus.—Oblong-ovate, very slightly convex, brassy-green or violaceous, under side black, the anterior tibiæ somewhat serrated externally. ¾-1½.—*Lat. Gyllen.*

Very thickly punctured and finely pubescent, of a brassy-green or violaceous colour: antennæ dusky black: thorax scarcely emarginate in front, the sides somewhat rounded, moderately convex on the disk: elytra wide, ovate, the apex truncate and scarcely narrower than the base: under side black and punctured: legs pitch-black, the anterior tibiæ long, bent, and serrated on their external edge, although sometimes very indistinctly.

Not unfrequent on the flowers of trees and herbaceous plants.

M. viridéscens.—Oblong-ovate, shining greenish-blue, base of the antennæ and legs testaceous-red, the anterior tibiæ simple. 1¼.—*Fab. Marsh. Gyllen.*

More convex than the preceding, and of a brighter lustre, nearly smooth, greenish or bluish: head deflexed, thickly punctulated, eyes black; antennæ rufo-testaceous at the base, the club dusky ferruginous: thorax smooth on the disk, the sides with scattered pubescence, rather convex and thickly punctured: elytra the breadth of the thorax at the base, the apex obtusely rounded, convex above, glabrous and shining, the punctures rather large and not very closely placed: under side black, very minutely punctured: legs rufo-testaceous, the anterior tibiæ without serratures on their external edge.

Var. *b.* Finely pubescent, legs dusky with the anterior tibiæ pale.—*M. cærulea, Marsh.*

On flowers during summer not scarce. We have seen it in great profusion on the flowers of the lime tree and sycamore. *M. cærulea* of Marsham and Stephens does not appear to be specifically distinct.

M. Pediculárius.—Short ovate, convex, shining black, thorax very slightly emarginate in front, the posterior tibiæ with an obtuse angle in the middle. ¾-1.—*N. Pedicularia, Fab. Gyllen. Silpha Pedicularia, Linn. N. latipes, Marsh.*

Small, convex, and of a shining black colour, with very short indistinct pubescence: head angular, the forehead convex and punctured: antennæ ferruginous at the base, black at the apex: thorax convex, punctulated, margined on the sides, the front just perceptibly emarginate: elytra thickly covered with small and distinct punctures, the colour black, with a faint metallic lustre: under side black and punctured: legs pitchy or pale.

Occurs plentifully on flowers, especially those belonging to the class *Syngenesia*. On the flowers of the Dandelion in the spring, frequent.

M. nigrínus, a minute species, distinguished by its short and glossy body, with black legs and antennæ, is the only other Scotch *Meligethes* that has hitherto occurred to us.

GENUS—CATÉRETES, *Herbst.*—Antennæ rather longer than the thorax, clavate, the two radical joints nearly of equal length and thickness, the third not longer than the fourth, the three terminal ones forming an elongate compressed club: palpi with the terminal joint longest and somewhat thickened, especially in the labial pair: thorax large and narrowly margined: elytra considerably shorter than the abdomen, the apex truncate: body ovate, somewhat quadrate: legs short and stout.

C. Urtícæ.—Oblong-ovate, black, glossed with brassy, deeply punctured, antennæ and legs pale red. ½-1.—*Gyllen.* *Dermestes Urticæ, Fab.* *Silpha pulicaria, Marsh.*

Small, black, somewhat glossy: head large, angular, and thickly punctured: antennæ pale ferruginous: thorax not emarginate in front, but slightly rounded in the middle, the sides narrowly margined, and together with the hinder angles rounded; the surface finely pubescent and punctured: elytra wide and convex, thickly and deeply punctured, and slightly pubescent, the apex truncate and leaving a considerable portion of the abdomen exposed: under side black and punctured: legs short and strong, of a pale reddish colour.

On the plant from which it derives its specific name, plentiful.

GENUS—MICROPÉPLUS, *Latreille.* From *μικρος, small*, and *πεπλος, a covering*, the elytra being so short as to leave a considerable part of the abdomen exposed.—Antennæ short, received into a groove in the thorax, 9-jointed, the two basal joints large and pear-shaped, the remainder decreasing in length to the 9th, which forms a rounded pubescent club: thorax transverse, widest at the base: elytra quadrate, covering scarcely more than half of the abdomen: legs slender, with the thighs rather long; tarsi 4-jointed.—*Curtis, B. E.* v. 204.

M. porcátus.—Black, somewhat obscure, two basal joints of the antennæ and legs ferruginous, the sides of the thorax with a projecting tooth. ¾-1.—*Staphy. porcatus, Payk.* *Omalium porcatum, Gyllen.* *Nitid. porcata, Marsh.*

Small, rigid, dull black; head triangular, punctulated, rather depressed; the two basal joints of the antennæ rufous, the rest pitchy-black: thorax punctulated, the lateral margins dilated and slightly elevated, with a small obtuse tooth in the middle, the disk convex and very unequal, having two large foveæ in the centre placed one behind the other, and smaller ones on each side: elytra scarcely twice the length of the thorax, somewhat convex, the apex truncate and rather depressed, with three longitudinal ridges on each, the interstices dull black and coarsely punctured: abdomen with five segments projecting beyond the elytra, the sides reflexed, each segment with four deep quadrate foveæ placed crosswise, the margins of which are elevated: under side of the body dull black, punctulated; the legs slender, deep rusty-red.

Under stones in the neighbourhood of dunghills, and in manured fields, occasional. Fields near Duddingston. About Slateford.

M. staphylinoídes.—Black, somewhat shining, the sides of the thorax and legs ferruginous, the former without a projecting tooth. ¾.—*Steph. Illus.* pl. xvi. f. 6. *Nitid. Staphylinoides, Marsh.*

Less than the preceding, more depressed, and of a more shining black: head with a triangular impression; antennæ ferruginous: lateral margins of the thorax ferruginous-red, without an acute projection, the disk black, foveolated: elytra rather narrower than the thorax, with three elevated lines on each, one being close to the external margin, the interstices punctured and shining: the exposed portion of the abdomen glossy, carinated down the back, the foveæ rather obsolete: breast and under side of the abdomen pitchy-black; legs ferruginous-red.

In such places as the preceding, and rather more frequent, usually found adhering to the under side of stones. Salisbury Craigs. Fields and road sides south of Edinburgh, not unfrequent in the spring. We once found a variety in Duddingston Wood of an uniform ferruginous colour.

This singular genus comprehends but one other species, which was lately discovered in Ireland. It is figured in Curtis's B. E. v. 204, and is named *M. Tesserula.*

FAMILY—ENGIDÆ.

GENUS—TRICHÓPTERYX, *Kirby.* From θριξ, τριχος, *hair*, and πτερυξ, *a wing*, these members being furnished with a fascicle of hairs at the apex.—Antennæ rather more than half the length of the body, clavate, 11-jointed, the two radical joints cylindric, thickened, the rest filiform and slender, except the three terminal ones which are thickened, elongate, and pilose: palpi very minute: body rather convex, oval: head triangular: thorax large and wide, the sides slightly dilated and rounded; elytra with the apex somewhat truncate, the wings with long hairs at the apex, which are collected into small bundles or fascicles.—*Steph. Illus.* vol. iii. 59.

T. pusílla,—Ovate, black, smooth and glossy, the antennæ and legs pale testaceous. $\frac{1}{3}$.—*Scaphidium pusillum, Gyllen.*

Very minute, ovate, shining black, with the antennæ and legs pale: thorax transverse, wide, rounded on the sides: elytra ovate, dilated in the middle and attenuated to the apex, convex, shining black, smooth: under side pitch-black; legs short, compressed, of a pale testaceous hue.

Under withered leaves and in decaying wood. Cramond. Rosslyn.

GENUS—ATOMÁRIA, *Kirby.* From *atomus*, an atom, with reference to the diminutive size of the species.—Antennæ about the length of the thorax, clavate, the radical joint robust, 2d more slender, 3d shorter than the 2d, the 4th, 6th, and 8th joints shortest, the three terminal ones of equal length and forming an obtuse club, which is not clothed with hairs: palpi somewhat subulated: body ovate-elongate: head triangular: thorax rather depressed behind: elytra not truncate, covering the abdomen.—*Steph. Illus.*

A. mesómelas.—Black, pubescent, elytra testaceous, black at the base, base of the antennæ and legs testaceous-red. $\frac{3}{4}$.—*Der. mesomelus, Herbst. Cryptophagus mesomelus, Gyllen. Silpha phæorrhæa, Marsh.*

Head triangular, black and punctured, the mouth and antennæ ferruginous; the club of the latter dusky: thorax black, the anterior margin frequently rufescent, the sides dilated before the middle and rather narrowed behind, the sides and base margined: scutellum transverse: elytra rather wider than the thorax, thickly punctured and pubescent, testaceous-red, the base black, the edges of the black portion distinctly defined: under side pitch-black: legs pale testaceous.

Among the roots of withered grass, under dead leaves, &c. in damp places, seemingly not common.

A. nigripénnis.—Rufo-testaceous, glabrous, shining, elytra black and punctured, abdomen pitch-red. $\frac{3}{4}$-1.—*Dermes. nigripennis, Payk. Cryp. nigripennis, Gyllen.*

Short and convex: head rufous, eyes black; antennæ rufo-ferruginous; thorax of a similar colour, the hinder part widely and deeply impressed, the disk elevated and punctulated; elytra wider than the thorax, shining black, sprinkled with scattered punctures: abdomen pitch-red, legs ferruginous.

In such places as the preceding, rather rare. Cramond and Dalmeny woods.

A. hírta.—Oblong-ovate, convex, ferruginous-red, with the legs paler, the surface covered with strong hairs. ¾–1.—*Silpha hirta, Marsh.*

Considerably convex, short, of a uniform ferruginous-red above, and covered with strong hairs: head and thorax minutely punctulated: elytra deeply and rather remotely punctured; antennæ and legs paler than the upper side of the body.

Not very common. Corstorphine Hill. Cramond, &c.

A. nigrivéntris.—Oblong, testaceous, with the thorax and abdomen dusky, antennæ and legs yellowish. ½–⅔—*Kirby. Steph.*

Body somewhat linear, depressed, of a testaceous colour, the thorax brown: antennæ placed rather close together at the base, yellowish: abdomen brown: legs yellowish or testaceous-red.

Individuals have been taken in the same situations as the preceding species.

In addition to the above, we are enabled to record the following species as inhabitants of the more southern parts of Scotland:—*A. perpusilla, A. minutissima, A. melas, A. nitidula, A. carbonaria, A. linearis.* The first four belong to the genus *Anisarthria* of Stephens, and are distinguished from the true *Atomariæ* by a slight difference in the structure of the antennæ.

Genus—**CRYPTÓPHAGUS**, *Herbst.* From κρυπτος, *hidden*, and φαγος, *eating.*—Antennæ robust and pilose, 1st and 2d joints globose, 3d longest clavate, 5 following small globose, the rest forming a loose club, of which the two first joints are cup-shaped, the 3d conical (Pl. 1. fig. 17.): palpi with the terminal joint elongate-ovate: mandibles bifid at the apex, the internal margin crenated: head triangular: thorax transverse, subquadrate, with the angles rounded, the sides often furnished with small teeth: legs rather short; tarsi 5-jointed, the posterior pair in one of the sexes occasionally 4-jointed, the terminal joint nearly as long as all the rest united.—*Curtis, B. E.* iv. 160.

C. Lycopérdi.—Oblong-ovate, dark ferruginous, deeply punctured and clothed with long pubescence, the sides of the thorax each with two acute teeth. 1¼–1½.—*Herbst. Gyllen. Corticaria rufa, Marsh.*

Oblong-ovate, dusky ferruginous; head somewhat castaneous, punctate; antennæ of a similar colour, the club rather pale: thorax the colour of the head, convex, thickly and rather deeply punctured, and clothed with long hairs, the lateral margin with a single tooth near the middle: scutellum minute, transverse: elytra moderately convex, rufo-ferruginous, the suture more obscure, with pale pubescence, irregularly punctate, the punctures more minute than those of the thorax: under side of the body pale ferruginous, shining, punctate, nearly free from pubescence; legs pale testaceous.

Inhabits *Lycoperdon bovista*, Latticed Puff-ball. Roots of grass on sand-banks near the sea, &c.

C. fumátus.—Oblong-ovate, testaceous, slightly punctate and clothed with fine pubescence, thorax with two obtuse teeth on each side, one at the anterior angle and another in the middle. 1–1¼.—*Gyllen. Cortic. fumata, Marsh.*

About the size of the preceding and bearing considerable resemblance to it, but differs in being of a paler colour, more delicately punctured, and clothed with finer hairs: antennæ rather dusky, the club paler: thorax nearly straight on the sides, with an obtuse oblique tooth at the anterior angle, and another inconspicuous one in the middle: elytra covered with short pale pubescence: under side testaceous, shining: legs pale.

Of occasional occurrence in various situations.

C. celláris.—Oblong-ovate, dark ferruginous, elytra dusky black; thorax with an acute tooth in the middle of the lateral margin, the space behind crenated. 1¼.—*Dermes. cellaris, Fab. Corticaria denticulata, Marsh.*

Less than the preceding, shining, punctured, pubescent: head and antennæ ferruginous, the former punctulated; eyes black: thorax ferruginous, short, convex, punctured, and pubescent, the base and sides margined, the latter slightly produced at the anterior angles, and having an acute tooth in the middle, the space between which and the basal angles is finely denticulated: elytra moderately convex, punctured, and clothed with a pale pubescence, the colour dusky black, frequently with the base more or less ferruginous: under side pitchy ferruginous; legs pale testaceous.

Var. b. Colour entirely testaceous-red.

Plentiful in the autumn. We have seen it very abundant in houses, lurking about the frames of windows, and once observed it in profusion on *Agaricus muscarius* and other species of fungi.

C. tuberculátus, known from its having two elevated tubercles on the disk of the thorax, has been found in Argyllshire and near Jedburgh.

GENUS—ANTHERÓPHAGUS, *Megerle.* Derived from *ανθηρος, flowery*, and *φαγος, consuming.*—Antennæ nearly the length of the thorax, clavate, the radical and three terminal joints large, and the seven intermediate ones minute, transverse: palpi very small, the terminal joint longest, subulated, with the apex obtuse: body oblong-ovate: head nearly orbicular: thorax not dentate on the lateral margins: elytra entire at the apex, and covering the abdomen: tarsi 5-jointed, the posterior pair in one of the sexes 4-jointed.

A. pállens.—Ferruginous, slightly pubescent, thorax rectangular convex, and, together with the head, deeply punctured. 2–2¼.—*Tenebrio pallens, Linn. Cryptoph. pallens, Gyllen.*

Head deep ferruginous, slightly pubescent, thickly covered with large punctures; antennæ pale, the middle joints dusky at the base: thorax shining ferruginous, with straight angles, convex, and deeply punctured: elytra rather of a paler hue than the thorax, pubescent and almost imperceptibly punctulated, with a single abbreviated stria beside the suture: under side deep ferruginous: legs pale testaceous.

Not common: woods on banks of the Almond above Cramond Bridge. We have seen specimens from Dumfries-shire, and observed the insect among the Clova mountains.

GENUS—BÝTURUS, *Latreille.* Byturus a kind of worm mentioned by Pliny, and said to injure the vines in Campania.—Antennæ scarcely the length of the thorax, the two radical joints robust, equal, the six following short, the three last forming an elongate compressed club, of which the two lowest joints are transverse and triangular: palpi filiform; the terminal joint of the maxillary pair elongate, attenuated to the apex: maxillæ with two short membranous processes, the external triangular, the internal sublinear: mandibles with a tooth beneath the apex: body oval or oblong: thorax widest behind, with acute angles: elytra narrow and elongate, covering the abdomen: tibiæ slender; tarsi with the 2d and 3d joints bilobed.—*Lat. Gen.* ii. 17.

B. tomentósus.—Brownish, thickly clothed with reddish-yellow pubescence, antennæ and legs testaceous-yellow. 2.—*Lat. Dermes. tomentosus, Fab. Oliv. Marsh.*

Brownish or testaceous, rather thickly covered with depressed greyish-yellow hairs: head narrow in front, punctured, the mouth testaceous; antennæ pale: thorax short, the basal margin somewhat sinuated, the sides rounded, the hinder angles widely depressed: elytra convex, attenuated behind, thickly punctured and clothed with dense pubescence: under side dark piceous, pubescent; legs pale testaceous.

In woods and shrubby places, not very common. It frequents flowers, especially those belonging to the genera Rubus and Padus, for the purpose of feeding on the pollen, employing its palpi to lay open the anthers. Rosslyn Woods, Cramond and Dalmeny, &c.

GENUS — RHYZÓPHAGUS, *Herbst.* Perhaps from ϱιζα *a root*, and φαγος *eating.*—Antennæ much shorter than the thorax, the radical joint large and clavate, 2d small, truncate, 3d obconic, 4–9 short, gradually increasing in diameter, 10th large, rounded, pilose, 11th minute and obscure: palpi very short and indistinct: mandibles arched, bifid at the apex: body linear-elongate, narrow, free from pubescence: thorax subquadrate: elytra truncate at the apex; 4 anterior tarsi 5-jointed, posterior pair 4-jointed.—*Gyllen. Insecta Suecica*, iii. 420.

R. ferrugíneus.—Ferruginous, shining, thorax deeply punctured, elytra strongly punctate-striate, the middle of the antennæ dusky. 2¼–2½.—*Gyllen.*

Larger than the other species of the genus, of a shining ferruginous colour, glabrous: head suddenly contracted before the insertion of the antennæ, and impressed with a fovea on each side; eyes black; antennæ ferruginous at the base and apex, the centre dusky: thorax longer than broad, narrowly margined on the lateral and basal edges, the hinder angles obliquely rounded, the disk convex and deeply punctured; elytra the width of the thorax, the shoulders prominent, and the apex truncate, the surface deeply punctate-striate: under side and legs of the same colour as the upper side, the former distinctly punctured.

Not common. Under bark of trees, in rotten wood, &c. Rosslyn. Corstorphine Hill.

R. díspar.—Linear, shining, thorax oblong narrowed behind, elytra punctate-striate, with the apex truncate. 1¼–1½.—*Gyllen. Steph.*

Narrow, linear, ferruginous, more or less piceous above: head rufo-ferruginous, finely punctulated: palpi and antennæ ferruginous: thorax elongate, widest in front, gradually narrowing to the base, of which the angles are rounded, margined on the sides and behind, the disk rather convex, finely and distinctly punctulated: elytra scarcely more than twice the length of the thorax, the shoulders somewhat prominent, the apex truncate, leaving a small part of the abdomen uncovered, delicately punctate-striate, and of a rufo-ferruginous colour at the base and apex, the centre pitchy-black; under side of the body and legs rufo-ferruginous.

Not very common, but found occasionally under the bark of trees, and

in the Boleti which grow upon their trunks. Collinton, Duddingston Wood.

R. bipustulátus.—Linear, pitchy-black, shining, the antennæ and feet ferruginous, elytra with a ferruginous spot towards the apex of each. 1¼. —*Steph. Gyllen. Var. b. of R. dispar.*

Less than the preceding, and generally of a deeper colour: head rather small: the antennæ ferruginous: elytra distinctly punctate-striate, pitchy-black, each having a ferruginous spot, variable in shape, towards the apex, and frequently another of a smaller size on the shoulder: legs ferruginous.

Found in such places as the preceding, but far from frequent. In the *Polyporus squamosus*, Duddingston Wood.

GENUS—MONÓTOMA, *Herbst.*—Antennæ shorter than the thorax, 10-jointed, the radical joint large, 2d smaller and obconic, 3–9 short and somewhat globular, the 10th large, globose, the apex acute: palpi minute filiform; maxillary with the terminal joint truncate: maxillæ bifid, the internal lobe minute: body oblong-ovate, considerably depressed: thorax crenated on the sides: elytra wider than the thorax, the apex truncate: thighs clavate.

M. pícipes.—Dull black, with strong hairs, antennæ and legs ferruginous, elytra crenate-striate. 1¼–1½.—*Herbst. Steph. Corticaria contracta, Marsh. Cerylon picipes, Gyllen.*

Rather narrow and depressed, thinly covered with rigid hairs, and of a dull black colour; head triangular, thickly punctured, the crown with an acute elevation on each side behind the eyes; antennæ ferruginous: thorax longer than wide, the anterior angles somewhat prominent, the sides straight and finely crenulated, the surface closely punctured, and marked with two oblong slightly oblique impressions within the base: elytra truncate at the tip, exposing a portion of the abdomen, the surface closely and rather obsoletely crenate-striate, the interstices faintly wrinkled across, and bearing rows of short cinereous pile: under side piceous: legs pale testaceous.

Under the bark of trees, and occasionally in houses, like some of the Cryptophagi and Latridii, not common. Cramond and elsewhere.

GENUS—BÍTOMA, *Herbst.*—Antennæ very little longer than the head, capitate, two radical joints robust, six following short, somewhat quadrate, gradually widening, 9th transverse ovate, 10th and 11th forming a thick club, the former semicircular, the latter nearly orbicular: palpi with the terminal joint as long as the others taken together: maxilla terminating in a rounded lobe, the internal lobe slender (Pl. I. fig. 19.): thorax quadrate: elytra narrow, rounded at the apex, and covering the abdomen: all the tarsi 4-jointed, the unguicular joint long and clavate.—*Curtis, B. E.* vi. 283.

B. crenáta.—Dull black, antennæ and legs pitch-red, elytra rufous, black in the centre, punctate-striate, the alternate interstices elevated. 1¼–2.—*Gyllen. Lyctus crenatus, Fab.*

Rather dull black: head obscurely punctured, with two impressions anteriorly, mouth and antennæ ferruginous; thorax with an elevated margin at the sides, which are likewise slightly crenulated, having a channel down the centre, a curved line on each side, and a longitudinal ridge at some distance from the lateral margins, and parallel with them: elytra a little remote from the thorax, convex, crenate-striate, the alternate interstices forming acute ridges; the colour deep ferruginous, with the suture and a wide band across the middle black: under side pitch-black: legs ferruginous.

Mr Curtis informs us that this pretty insect had not been discovered in England when Marsham published his Coleoptera, but that it was taken a few years afterwards by Mr Haworth, and has been found more recently in the New Forest, under the bark of beech trees. It has occurred in Duddingston wood in this neighbourhood, and in some places more to the south.

GENUS—CORTICÁRIA, *Marsham*. Derived from *Cortex*, many of the species living beneath the bark of trees.—Antennæ longer than the thorax, 11-jointed, the radical joint robust, 2d smaller than the 1st, but larger than the following, 3–8 slender, elongate, cylindrical, the 9th and 10th rather remote from each other, thick; 11th large and somewhat globose: maxillary palpi with the last joint rather thick, conical: body oblong: thorax somewhat heart-shaped, not margined: elytra covering the abdomen: thighs somewhat thickened: tarsi slender *.—*Gyllen. Ins. Suec.* iv. 125.

C. pubéscens.—Ferruginous-brown, with long pubescence, thorax rather long, crenated on the sides, and impressed with a large fovea behind. 1–1½.—*Latridius pubescens, Illig. Gyllen. Lat. fenestralis, De Jean, Cat.*

Generally ferruginous, but very variable in colour, sometimes approaching to brown or black: head transverse, obsoletely marked with punctures, pubescent: antennæ ferruginous and pubescent: thorax a little rounded on the sides before the middle, considerably narrowed behind, the lateral edges very obscurely crenated; ruggedly punctured above, clothed with long hairs, and having a rounded fovea in the middle posteriorly: elytra nearly twice the breadth of the thorax at the base, dilated at the middle, the apex rounded; clothed like the thorax, and covered with closely placed punctured striæ, the interstices punctured; under side pitch-black or ferruginous, shining, and slightly pubescent: legs ferruginous, the tarsi paler.

Occurs on old walls, in out-houses, among grass, corn, &c.: not scarce.

C. crenuláta.—Pitch-brown, with long pubescence, thorax rather short and crenated on the sides. 1.—*Latrid. crenulatus, Gyllen.*

Similar to the preceding, but of a smaller size, and differing in the proportions of the thorax: colour varying from dark ferruginous to black; thorax short, almost equally rounded on the sides, and scarcely narrowed behind, the lateral margins obsoletely crenated; the surface closely punctured, pubescent, and impressed with a fovea as in *C. pubescens:* elytra nearly as in that species: legs ferruginous.

In such places as the preceding, but not found so frequently.

C. ferrugínea.—Chesnut colour, glabrous, head blackish, thorax quadrangular, as wide as the elytra, the latter pale, punctate-striate, the interstices without punctures. 1.—*Marsh. Latrid. ferrugineus, Gyllen.*

Nearly linear: head black or pitchy, minutely punctulated; antennæ pale: thorax a little wider than long, very little narrower than the elytra, dusky ferruginous or chesnut colour, thickly punctured, glabrous, and having a fovea in the middle towards the base: elytra rectangular at the shoulders, which are somewhat elevated, pale testaceous, glossy, and free from pubescence, punctate-striate, the interstices not punctured: under side testaceous-red, just perceptibly punctured: legs pale.

At the roots of grass in damp shady places; found also in houses.

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* According to Latreille and De Jean, the species of this genus have four tarsal joints; while, according to Müller and Gyllenhal, they appear distinctly triarticulate.

C. gibbósa.—Ferruginous-brown, thorax narrow, rounded behind, with a transverse arched impression a little behind the middle, elytra pilose. ¼–¾.—*Latrid. gibbosus, Gyllen. Corticaria impressa, Marsh.*

A small species, short and convex, of a rusty colour, sometimes rather pale ferruginous: head large, thickly punctured anteriorly; antennæ testaceous, with the club dusky: thorax of equal length and breadth, the sides rounded before the middle, the basal margin likewise rounded, the angles not prominent, the surface thickly punctured, and having a long transverse impression behind the middle, which sometimes appears to be formed by the approximation of three smaller foveæ: elytra nearly one-half wider than the thorax, with the shoulders prominent, convex, striate-punctate, wrinkled across, and having longitudinal rows of short cinereous pile: under side brown: legs pale testaceous.

In such places as the other species, rather of frequent occurrence.

GENUS—**LATRÍDIUS**, *Herbst.* From *lateo*, to lurk: hence the German name *Lauerkäfer*, which may be translated Lurking Beetle.—Antennæ about the length of the thorax, clavate, the radical joint large and orbicular, 2d ovate, thicker than the six following, which are slender and nearly equal, except the 3d, which is smallest, three last forming a club, of which the terminal joint is largest, with the apex somewhat produced (Pl. I. fig. 19.): maxillary palpus 3-jointed, the two radical joints largest, terminal minute, ovate: thorax somewhat quadrate, rather narrowed behind: elytra much wider than the thorax, more or less oval: thighs thickened; tibiæ without spines; tarsi apparently 4-jointed, the unguicular joint longer than the others united.—*Curtis, B. E.* vii. 311.

The insects distinguished by the above characters are all minute, none of them exceeding a line and a half in length, and several being scarcely half that size. They occur in houses, damp vaults, cellars, &c.; and are not unfrequently found beneath the bark of trees. The larvæ are somewhat egg-shaped, and elongate, consisting of twelve segments, of a dirty white colour, the antennæ and legs clear as water, having a black line along the back, and a tuft of hairs on the sides of each segment. They live for a longer or shorter period in this condition, according to the state of the temperature and supply of food; the usual time is from four to six weeks. They are then changed into nymphs of a transparent white, with brownish-yellow eyes, from which the perfect insect emerges in about fourteen days. About a dozen species inhabit Britain [*].

L. minútus.—Oblong, pitch-black, the antennæ and legs testaceous, elytra glossy, deeply striate-punctate. 1–1¼.—*Lat. Tenebrio minutus, Linn. Latrid. porcatus, Herbst. Gyllen. Steph. Cortic. pulla, Marsh.*

Ferruginous, sometimes pitch-black, or testaceous: head dull black, punctulated, the mouth rufescent; the forehead impressed with a longitudinal line; antennæ ferruginous: thorax considerably widest in front, and slightly emarginate, the anterior angles dilated and rounded, the disk convex, thickly punctate, with a short impressed line in the middle anteriorly, and a transverse impression at the base, terminating at either end in a fovea near the basal angles: elytra with the shoulders somewhat elevated, the apex rounded, marked with an impression across the back towards the base, and deeply punctured striæ: under side piceous, more shining than the upper surface: legs reddish.

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[*] The above particulars are taken from "Beschreibung der ersten Stände des Lauerkäfers," in the 2d volume of Germar's "Magazin der Entomologie," to which reference may be made for a more detailed account.

In houses, occasional. Among the roots of grass at Figget Whins. Under bark of trees, Cramond, Rosslyn, &c.

L. transvérsus.—Oblong, ferruginous, thorax short and wide, with a deep transverse impression behind, elytra deeply striate-punctate. 1.—*Ips. transversa, Oliv. Cortic. transversa, Marsh. Latrid. sculptilis, Gyllen.*

Ferruginous, thickly punctured throughout: head with an impressed line down the forehead; eyes black and prominent; antennæ rather paler than the body; neck rather long and exposed, punctulated: thorax proportionably shorter and wider than in the preceding species, transverse, the sides slightly rounded, with a wide reflexed margin, having a faint central line in front, and a wide deep impression across the base: elytra very little wider than the thorax, the shoulders somewhat rounded, with closely placed striæ composed of large punctures: under side deep pitch-red; legs pale.

Found not unfrequently in most parts of the country.

The following insects, belonging to the present family, are natives of Scotland:—*Mycetæa fumata*, near Hawick, and in Dumfries-shire. *Tetratoma Fungorum*, Jedburgh. *Ips ferruginea* and *Ips quadri-pustulata*, both scarce insects, have been found at Raehills by Mr W. Little *.

FAMILY—DERMESTIDÆ.

GENUS—DERMÉSTES, *Linn.* From *δεϱμα, skin,* and *εσθιω, to eat* or *consume.*—Antennæ shorter than the thorax, clavate, radical joint large and ovate, seven following short and slender, the remaining three forming an ovate compressed club, of which the two lowest joints are somewhat dilated on the inner side, terminal smaller and rounded: maxillary palpi shorter than the maxilla, the latter with the external lobe short, the internal one in the form of a strong claw; mandibles with small teeth below the apex: body oval, narrow, pubescent: thorax wider than long, the hinder margin sinuated, or having an obtuse lobe in the middle: elytra long: tarsi 5-jointed, the penultimate joint not bilobed.

D. lardárius.—Black, pubescent, elytra with a broad cinereous band across the base, in which are three brownish or black spots. $3\frac{1}{4}$–$3\frac{3}{4}$.—*Linn. Fab.* &c.

Oblong, black, thickly covered with pubescence: head small, drawn within the thorax up to the eyes; mouth rufescent; antennæ dark pitch-red: thorax narrowest in front, slightly sinuated on the basal margin, the sides somewhat rounded, and margined, the surface convex, punctured, having a few scatttered tufts of cinereous hairs intermixed with the black pubescence: elytra very long, convex, thickly punctulated, and having a few very obsolete rudimentary striæ, the pubescence from the middle to the apex black, and from the middle to the base cinereous; the cinereous portion marked with three naked brown spots, placed transversely, and having its hinder margin waved: under side and legs pitch-black, the former more or less thickly covered with shining cinereous hairs.

On decaying animal substances, generally in or near houses, not very common.

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* A small linear depressed beetle, of a reddish-brown colour, frequently observed in brown sugar, belongs to the present family. Although described in many of our British systems of entomology, it cannot properly be regarded as a British insect, since it is a native of the East Indies. It is the *Sylvanus dentatus* of Latreille, *Corticaria dentata* of Marsham. Another species, *S. Surinamensis*, is likewise found not unfrequently in the same material.

D. murínus.—Black above, with numerous transverse waved lines, of a bluish ash-colour, under side white, scutellum yellow. 3¼–3¾.—*Linn. Fab. Der. nebulosus, De Geer.*

About the size of the preceding, but wider, and more convex: head punctured, the black pubescence mixed with grey hairs; antennæ black: thorax thickly punctured, black, ornamented with numerous short waved streaks, of a bluish-ash colour, running across the surface, and two large yellow spots, remote from each other, behind the middle: scutellum with fulvous hairs: elytra similar in colour and markings to the thorax, having a few obsolete striæ, most observable at the base: under side thickly clothed with stiff white hairs, which have a reddish colour in certain lights; legs black, the thighs surrounded with a white ring.

In such situations as the foregoing, but not so common.

GENUS—ATTÁGENUS, *Lat.*—Antennæ shorter than the thorax, not much longer than the head, 11-jointed, two radical joints robust, somewhat globose, three following slender, nearly square, the following three cup-shaped, the remainder forming a thick club, of which the two first joints are somewhat cup-shaped, the terminal very long cylindric-ovate in the male, short and ovate-conical in the female: maxillary palpus with the terminal joint considerably longest, elongate-ovate, attenuated to the apex: mandibles nearly square, the apex of one of them furnished with four small teeth: body oval, obtusely rounded at both ends: head very small: thorax sinuated behind, the central lobe triangular: elytra scarcely wider than the thorax: legs compressed; tarsi 5-jointed, the unguicular joint much the longest in the anterior pair, the 2d and 5th joints nearly of equal length in the others.—*Curtis, B. E.* vi. 247.

A. Péllio.—Black, pubescent, the elytra with a rounded white spot on the back of each near the middle. 1¾–2.—*Dermes. Pellio, Linn. Fab. Don.* vii. pl. 231, f. 3. *Der. bipunctatus, De Geer.*

Variable in size; the male considerably larger than the female: the colour black, slightly shining, and thickly clothed with pubescence: head punctured, narrowed in front; antennæ dull castaneous, the club black: thorax narrowest in front, where it is slightly emarginate, much widened behind, the basal margin sinuated, the surface punctured, the base with three white spots, one near each of the angles, and the other before the scutellum: elytra thickly punctured, without apparent striæ, sometimes of a dull chesnut colour, but usually black, with a white spot on each in the middle towards the suture, and occasionally a small white mark on the humeral angle: under side pitch-black, pubescent; legs reddish.

Not uncommon in cellars, out-houses, &c. consuming dried skins, old books, paper, &c. Sometimes proving very destructive to specimens of animals preserved in museums.

A. trifasciátus.—Brownish-black, the base of the thorax, and three waved bands across the elytra, fulvous. 1¾.—*Dermes. trifasciatus, Fab. Oliv. Lat. Curtis,* l. c.

" Pale black, shining, minutely punctured, and covered with decumbent hairs. Antennæ black. Thorax with the posterior margin covered with yellowish shining hair, forming a black square spot on the lobe (*i. e.* inclosing a square portion of the black part of the thorax), elytra with three transverse sinuated ferruginous bands, covered with ochreous pubescence, *the two pos*terior interrupted by the suture; a small spot on each side at the base and one at the apex ochreous also. Under side clothed with yellow pubescence. Tibiæ inclining to castaneous. Tarsi and claws entirely of that colour; the basal joint of the former very small."—*Curtis.*

"The only examples I have seen of this species are contained in the collections of the British Museum, and in that of Mr Haworth; the former specimens were taken by Dr Leach near Edinburgh."—*Steph. Illus.* It has not occurred near Edinburgh, nor, so far as we know, in Scotland, except in the instance mentioned.

SUBSECTION—HELOCERA.

FAMILY—BYRRHIDÆ.

GENUS—ANTHRÉNUS, *Geoffroy.*—Antennæ shorter than the thorax, and received into a groove beneath its anterior angles, clavate, the club consisting of three joints, of which the terminal one is very large and obtuse: palpi short and filiform, the terminal joint longest, cylindric, truncate: body ovate, somewhat rounded, depressed, generally covered with scales: head small, retractile within the thorax; the latter narrow in front, with its hinder margin produced in the middle in the form of a triangle: legs compressed, admitting of being closely applied to the body; tibiæ with a groove on their external edge to receive the tarsi, which consist of five joints.—*Lat. Gen.* ii. 37.

A. Scrophuláriæ.—Black, covered with scales, the sides of the thorax and three bands across the elytra white, the suture reddish. 1¾.—*Fab. Gyllen. Byrrhus Scrophulariæ, Linn.*

Head black, with a spot on the forehead composed of white scales; antennæ testaceous, the club obscure: thorax short and wide, narrowed in front, divided into three lobes behind, slightly convex, with a line down the middle, the sides clothed with white scales, and marked with a black spot: elytra ovate, prominent on the shoulders, black, with three whitish fasciæ, often interrupted internally, the suture clothed with reddish scales: under side white, squamose, the margins of the abdomen spotted with black: thighs black, tibiæ and tarsi dull rufous.

This insect was found by Mr Stewart, and is included in his list of Edinburgh Insects published in the 1st volume of the Wernerian Transactions. It has occurred once or twice since, but is uncommon.

GENUS—BÝRRHUS, *Linn.* PILL-BEETLE.—Antennæ shorter than the thorax, thickening gradually from the 4th joint to the apex; 1st joint large, 2d small globose, 3d long, slender, obconic, 4th short obconic, 5th turbinate, 5 following transverse, rounded on the sides, compressed, terminal ovate, conic (Pl. I. fig. 20): palpi with the terminal joint scarcely longer than the preceding, rather thick, ovate, truncate: mandibles bifid or trifid at the apex, a strong tooth in the centre, and a deep notch at the base: head sunk in the thorax; the latter narrowed in front, the sides slightly sinuated, all the angles acuminated: elytra very convex, covering the abdomen: legs compressed, short, received into cavities in the abdomen; tibiæ crenated externally; tarsi 5-jointed, the three central joints minute, the unguicular one long and clavate.—*Curtis, B. E.* iii. 135.

The larvæ of these insects have been observed by M. Waudouer. Their heads are large, their bodies narrow and elongated, with the last two segments more extended than the others; the first, or that of the prothorax, presents superiorly a very large corneous plate. This genus was confounded by De Geer with *Dermestes*, and by Geoffroy with *Cistela*. The species occur in fields, woods, and sandy places. They are not unfrequent by the side of highways, and although they fly with facility, they do not often use their wings. When handled or even approached, they apply the feet and antennæ so close to the body, as to present the appearance of a little ball, and simulate death with great perseverance.

A. *Elytra striated.*

B. pílula.—Oblong-ovate, clothed with dusky pubescence, elytra with longitudinal tufts of black hairs, forming interrupted lines. 3¾–4½.—*Linn.* *Samou.* 50. pl. 2. f. 3. *Wood.* pl. 7. *Cistela pilula, Marsh.*

Larger than any of the following; oblong-ovate, very convex, rather dull brownish-black, with short pubescence: head retractile, slightly convex on the forehead, the pubescence usually of a shining reddish-brown; antennæ and palpi black: thorax short, very convex, the sides slightly emarginate, all the angles produced and acuminated, the anterior ones deflexed and embracing both sides of the head, the disk punctulated and obscurely variegated with ashy and reddish-brown hairs: scutellum with black hairs: elytra very convex, dilated at the margin before the middle, faintly striated, and clothed with dusky cinereous pubescence, the alternate interstices with longitudinal tufts of black hairs: under side of the body convex, shining black, punctulated, the thorax and abdomen with a depression for the reception of the legs, which are short, compressed, coarsely punctate, black, with the claws pitchy-red.

Var. b. Under side of the body pale yellowish-red, legs castaneous.

This variety, which does not appear to be owing to immaturity, has been found on Salisbury Craigs.

This insect is usually found under stones and among short herbage, where the pubescence is liable to be rubbed off, rendering the appearance of the upper surface very variable. It is most frequently of a pretty uniform brownish-black, with matted pubescence on the parts least exposed to friction. It is not very common, but occurs at times in sandy fields chiefly during the spring months. Arthur's Seat. Pentland Hills, &c.

B. fasciátus.—Short, ovate, black, with thick matted pubescence, elytra with an abbreviated arched band of a ferruginous colour across the middle. 3½–4.—*Fab.* *Oliv.* *Gyllen.* *Cistela undulata, Marsh.*

Closely allied to the preceding, but shorter, proportionably wider, and more globose; head and thorax thickly pubescent, variegated with shining dusky-ferruginous hairs: elytra sometimes with interrupted lines of black pubescence, usually having a broad common ferruginous band across the middle, not reaching to the sides; this band is sometimes of a colour inclining to cinereous, and divided into three parts anteriorly: under side and legs as in *B. pilula.*

This species is very variable, and may be more certainly determined by its form, than by the characters deduced from its colour or markings.

Considerably more abundant than the preceding. It is most plentiful in sandy fields near the sea, and in some seasons appears in great numbers on Fisherrow and Musselburgh Links, during the months of March and April.

B. dorsális.—Short, oval, black, the thorax variegated with ferruginous, the elytra having a common ferruginous band across the middle. 2½–3. *Fab. Oliv. Gyllen. Cistela dorsalis, Marsh.*

Body black, thickly covered with depressed pubescence of the same colour, intermixed with scales of a metallic lustre: thorax with patches of ferruginous pile, one larger than the others in the middle: elytra minutely punctured and regularly striated, the alternate interstices with longitudinal linear tufts of black pubescence; having a short transverse band across the middle of the back, surrounded with a waved line of cinereous hairs: under side black, rather deeply punctured.

Not so frequent as either of the preceding species, but occurring at times in sandy places and in grass fields during the spring months.

B. várius.—Ovate, brassy-black, elytra brassy-green, striated, the alternate interstices bright-green, spotted with black. 2–2½ : 1½–1¾.—*Fab. Cis. sericea, Marsh.*

Ovate, head and thorax shining brassy, the latter obsoletely variegated with dusky-ferruginous pubescence: scutellum brassy: elytra with faint striæ, brassy-green, the alternate interstices more vivid green, tessellated with dark-coloured quadrate spots; under side of the body and legs black, finely punctulated.

In grassy places, and under trees, occasional. Near Collinton, Rosslyn, &c.

B. *Elytra without striæ.*

B. ǽneus.—Oblong-ovate, brassy above, scutellum whitish, elytra irregularly punctured, without striæ. 2–2¼.—*Fab. Gyllen. Oliv. Wern. Mem.* vol. vi.

Oblong-ovate, shining brassy, often tinged with green: head convex, punctulated, with a cinereous pubescence; antennæ and palpi black: thorax short, very convex, punctulated and pubescent; scutellum rounded, covered with white hairs: elytra very convex, shining brassy, sometimes rather obscure, thickly and irregularly punctured, and without striæ: under side of the body and legs black, clothed with a dense ashy pile.

As in the other species, the under side of the body and legs are sometimes ferruginous. The *B. æneus* was described for the first time as British by Mr Duncan, in the Memoirs above cited. "This well-marked species," he observes, "which I have now the pleasure of adding to the British Fauna, was taken last June in an open part of a wood near Newbattle House, and it has occurred since under stones on Musselburgh Links. It is likewise found in Dumfries-shire." Several specimens were procured last autumn from a sandy haugh on the banks of the Teviot, opposite the town of Hawick.

GENUS—SIMPLOCÁRIA, *Marsham.*—Antennæ similar to those of the preceding genus, gradually thickening from the 7th joint, 2d joint small ovate, 3d slender, much the longest, 3 following short, subovate, the remainder thicker, the last large, ovate: palpi with the terminal joint elongate-conic, longer than the preceding: mandibles

bifid or trifid at the apex, with a very deep notch in the middle: head nearly concealed in the thorax; the latter short, transverse, narrowed anteriorly: elytra convex, covering the abdomen: legs compressed; thighs convex externally; tibiæ not grooved; tarsi 5-jointed, the unguicular joint longest in the anterior pair, the basal joint longest in the others.—*Curtis, B. E.* vii. 335.

S. semistriáta.—Ovate, shining black, pubescent, elytra striated at the base, antennæ and legs ferruginous. 1¼–1½.—*Byrr. semistriatus, Illig. Gyllen. Cist. picipes, Marsh. Curtis, l. c.*

Small, ovate, shining black, tinted with brassy, and thinly clothed with short cinereous hairs: forehead convex, shining, punctulated; antennæ and palpi pale ferruginous: thorax short, convex, punctulated, the base rounded: scutellum small and narrow: elytra widest near the shoulders, convex anteriorly, the sides and apex frequently pitchy-red; having six striæ on each, the sutural one entire, the rest becoming obsolete before reaching the apex: under side of the body black, minutely punctured and pubescent; legs ferruginous.

Beneath stones in sandy places, not unfrequent. Salisbury Craigs. Bottom of Blackford Hill. Bell's Mills. Water of Leith, &c.

FAMILY—HISTERIDÆ.

GENUS—**ONTHÓPHILUS**, *Leach.* From ὀνθος, *dung*, and φιλος, *a lover.* **—Antennæ capitate, slightly geniculated, 1st joint long, robust, subclavate, 2d subglobose, 3d long, slender, obconic, 5 following small, subglobose, the three terminal ones forming a globose-ovate, club (Pl. 1. fig. 21): maxillary palpus 4-jointed, the 1st and 3d joints minute, the 2d and 4th rather long and of equal length: body rounded-quadrate: head small: thorax and elytra furrowed, the latter slightly truncate at the tip, exposing a very small portion of the abdomen: legs long and slender; tarsi 5-jointed, the joints equal in length, except the unguicular one, which is elongate.—*Curtis, B. E.* v. 220.**

O. striátus.—Deep black, thorax with six elevated lines, the elytra with an equal number on each, the club of the antennæ dusky. 1.—*Hister striatus, Fab. Marsh.*

Black, glabrous and shining: head punctured, having a short elevated line on the crown; antennæ black, the club brownish: thorax very slightly emarginate in front, the hinder margin produced into an obtuse angle in the centre; having four entire elevated lines, and a short one on each side at the base, the spaces between punctured: elytra with six elevated lines on the disk of each, and two others less conspicuous on the inflected margin, the interstices striated and impressed with a row of punctures, the spaces between which are slightly elevated: apex of the abdomen and under side of the body covered with large punctures: legs black or brownish-black.

Not common near Edinburgh, nor seemingly in any place to the north of it, but of frequent occurrence in Roxburghshire, Dumfries-shire, and other more southern counties. Cramond. Near Dalkeith.

GENUS—**HÍSTER**, *Linn.*—Antennæ shorter than the thorax, inserted at the base of the mandibles, and usually concealed in a groove under the anterior angles of the thorax; geniculated, the radical joint long, robust, conic, 2d rather long, slender, cylindric, six following very **short, transverse, the 8th forming the base of a solid ovate-subglo-**

bose, compressed, 3-jointed club; palpi short and filiform, the terminal joint longest, somewhat cylindric, obtuse: mandibles with a process on the inner side obtusely bidentate: body nearly quadrate: thorax transverse: elytra truncate at the tip, exposing the apex of the abdomen, which is very obtuse: legs strong and contractile; tibiæ wide and compressed, dentate externally; tarsi 5-jointed.—*Lat. Gen.* ii. 46.

In the earlier editions of the Systema Naturæ, the insects of this genus were grouped among the Coccinellæ. At an after period they were separated from these by the great Swedish Naturalist, under the name of Hister, a genus likewise adopted by Geoffroy, but improperly called *Attelabus* by the latter author. The present appellation is supposed to be derived from *Histrio*, a word of Tuscan or Etruscan root, signifying an actor, and was probably bestowed in consequence of their instinctive propensity to simulate death. The species usually occur in dung, or beneath animal remains. A few are found beneath the bark of ancient or decaying trees. Some of the Linnean species now form the genera *Abræus*, *Onthophilus*, *Dendrophilus*, of Dr Leach and other recent writers. We know little of their transformations. The elytra of this genus are remarkable for their extreme hardness. Even the pin of the entomologist is with difficulty made to enter.

A. *Thorax with two striæ on the sides.*

H. unícolor.—Shining black, elytra with three striæ extending the whole length, the anterior tibiæ with three teeth on the outer edge, the apical one bifid. 2¾–4.—*Linn.* &c. *H. inæqualis*, *Marsh.*

Somewhat square, a little narrowed before and behind, entirely shining black: head very small, flattened on the front, and impressed with a semicircular line; stalk of the antennæ generally rufescent, the club black: thorax smooth and glossy, with two rather deeply impressed lines on each side, parallel with the lateral margins; the innermost not reaching to the base, and continued round the anterior margin: elytra rather flat, with four entire subpunctate striæ on each, and three abbreviated ones next the suture, extending from the apex nearly to the middle: abdomen behind the elytra very obtuse and thickly punctured: under side and legs shining black; the tibiæ broad and compressed, the anterior pair with three teeth on the external edge, of which the one nearest the apex is bifid.

Frequent under stones, and on dead animals. Sea shore. King's Park, &c.

H. cadaverínus.—Shining black, elytra with five striæ extending the whole length, the anterior tibiæ with five or six teeth on the external edge. 2¾–3½ : 2–2¼.—*Ent. Hefte.* *Hister brunneus*, *Fab.* *Gyllen.*

Similar to the last, but usually of a smaller size: glossy black, head and thorax as in *H. unicolor*, the thorax perceptibly punctulated on the sides, the lateral lines deeply impressed, and reaching nearly to the base: elytra with five entire subpunctate striæ on each, and two short ones at the apex towards the suture, having a transverse impression within the apex, and one or two impressions near the base towards the scutellum: sides of the abdomen punctured, the anterior tibiæ armed with five or six teeth externally: in other respects scarcely differing from *H. unicolor*.

Perhaps the most abundant species of Hister found in this neighbourhood. Plentiful on carcasses on the shores of the Firth, and in other places.

B. *Thorax with a single stria on the sides.*

H. carbonárius.—Black, elytra with five entire striæ externally, and a punctured fovea on the lateral margin, the anterior tibiæ with five or six small teeth. 2–3.—*Ent. Hefte. H.* 12-*striatus, Fab.*

Black, somewhat shining; head and antennæ as in the preceding: thorax with a single impressed line on each side at a little distance from the edge, continued round the anterior margin: elytra with five entire striæ, and two short ones at the apex towards the suture, the third from the suture frequently abbreviated at the base; the inflected margin of the elytra impressed beneath with an oblong punctured fovea: sides of the abdomen punctured, the anterior tibiæ with five or six small teeth.

Among dung and under stones, occasional.

H. purpuráscens.—Shining black, elytra red on the disk, with five entire striæ on each, the anterior tibiæ with five teeth. 1¾–2: 1¼–1½.—*Fab. H. bipustulatus, Marsh.*

Considerably less than any of the foregoing, glossy black: head with the usual arched line; thorax with a single impressed line within the lateral and anterior margins: elytra glossy black, with a red spot in the middle, sometimes occupying the whole disk; having five entire striæ externally, and two abbreviated ones at the apex internally; the elongate fovea on the inflected margin impunctate, and marked with a longitudinal stria: under side convex, glossy black, the sides and obtuse apex of the abdomen punctured: legs piceous, the anterior tibiæ with five or six teeth.

More plentiful seemingly in the Edinburgh district than in most parts of the south of Scotland. Sea shore at Leith and Portobello. Salisbury Craigs. Under trees at Morningside.

C. *Thorax without lateral striæ.*

H. marítimus.—Oblong, black, thorax smooth, except the hinder margin, which is narrowly punctate. 1½–2.—*Kirby. Steph.*

Proportionally longer than the other species, black, slightly shining, convex: antennæ dark red, or blackish at the base: thorax smooth, free from punctures on the front and sides, the base alone being narrowly punctured: elytra punctate at the apex, with a punctured stria along the side of the suture, which is bent round the scutellar angle, and runs obliquely down the disk, disappearing rather beyond the middle; exterior to this are three other striæ, and an obsolete one on the shoulder: under side and apex of the abdomen punctured: legs pitch black; anterior tibiæ armed with five or six teeth.

On the sea shore, occasional. West of Newhaven. Sand bank at Canonmills. Shore near Cramond.

H. aéneus.—Brassy-black, thickly punctured, the disk of the thorax, and basal half of the elytra, smooth and glossy, the latter punctured on the sides. 1¼–1¾.—*Fab. Marsh.*

Bright brassy-black; head rather convex, finely punctulated: antennæ black: thorax narrowly margined, with a wide punctured space on each side, the front and hinder margin very narrowly punctured; the disk brassy-black, glossy: elytra wide, a little convex, the hinder half and the outer margin thickly punctured, the disk anteriorly, and an elevation at the shoulder, smooth and glossy; having a punctured stria along the side of the suture, which is curved at the base, and continued in an oblique direction down the middle of the smooth space, a third a little remote from it, beyond which the surface is punctured, and a fourth, short and indistinct near the humeral elevation; under side convex, the sides of the abdomen punctured: legs pitchy, the anterior tibiæ with small teeth on the outer edge.

In cow pastures, common. King's Park. Fields all round Edinburgh during the summer months.

H. rotundátus.—Ovate, black, somewhat depressed, punctured throughout, elytra with four abbreviated striæ, the sutural one wanting. 1¼.—*Fab. Illig. Gyllen.*

Small, not very convex, black; forehead convex and punctured; antennæ black, the club ferruginous: thorax punctured throughout, the front rather narrowed, and the sides scarcely margined: elytra glossy black, punctured, with four deeply punctured striæ on each, extending obliquely from the base to the middle, the interior curved round the scutellar angle, but not continued along the side of the suture: under side and legs pitch black, the anterior tibiæ with small teeth on their outer edge.

This minute and well marked species has been taken several times at Cramond, but it is far from common.

H. nitídulus is the only other individual we have met with in Scotland, but many others doubtless occur, as the genus contains upwards of thirty species.

GENUS—DENDRÓPHILUS, *Leach* From δενδρον *a tree*, and φιλος *a lover*.—Antennæ slightly geniculated, capitate, the basal joint robust and clavate, nearly as long as the rest of the antennæ exclusive of the club, 2d rather robust obconic, 4 following short and equal, 7th and 8th larger, the three last forming a solid oval pubescent club: maxillary palpus with the terminal joint elongate-ovate, as long as the two preceding ones; labial palpi composed of two joints of equal length: body ovate-quadrate, somewhat convex: thorax short and transverse: elytra truncate at the apex, nearly covering the abdomen: tibiæ compressed, grooved externally and slightly serrated: tarsi 5-jointed, unguicular joint longest.—*Curtis, B. E.* iii. 131.

D. punctátus.—Dull black, very closely punctured throughout, elytra with four striæ on each, the interior two not extending beyond the middle. 1.—*Steph. Hister punctatus, Illig. Gyllen.*

Similar to the last species of the preceding genus, but still more minute: ovate, dull black: forehead obsoletely punctured: antennæ dusky at the base, the rest dark reddish: thorax somewhat convex, narrowed anteriorly, and produced in the middle beneath; the entire surface closely punctured: elytra punctured in a similar manner, and marked with four slightly arched striæ, the two next the outer margin extending nearly to the apex, the other two disappearing about the middle; sutural stria wanting: under side piceous: legs pitch-red, the tibiæ minutely crenated on their outer edge.

This rare insect occurs very sparingly under the bark of trees at Cramond.

SUBSECTION—LAMELLICORNES.

This important division includes all the insects classed by Linnæus in the old genera Scarabæus[*] and Lucanus. The Lamellicorn tribes include a very numerous assemblage, many of which, especially such as feed on flowers and living vegetation, (called *Thalerophaga* by Macleay) are remarkable alike for beauty of form, and splendour of colour. They are all winged insects, although for the most part rather dull and heavy in their movements.

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[*] The Scarabæidæ as now restricted are chiefly tropical forms, that is, the species in the warmer regions of the earth are to those from beyond the tropics, nearly as 5 : 1. Out of 450 species and upwards, in the collection of Mr Alexander Macleay, only nine are natives of England, and of these eight are *Onthophagi*.

The larvæ are long, semi-cylindrical, soft, of a whitish colour, and divided into 12 rings or segments. The head, of a harder consistence, is armed with strong mandibles. The feet are six in number, and squamous, or of a scaly texture. On each side of the body there are nine stigmatic openings. The posterior extremity is the most bulky; it is rounded, and almost always curved inwards, in such a manner as to prevent the larva from extending itself in a straight line. Its motions are consequently slow and awkward, and when crawling on the surface, it frequently rolls over, or falls on one side. The nympha or intermediate state, is, in some instances, not assumed till after the lapse of several years. Immediately preceding the assumption of that state, the larva protects itself by means of a cocoon of an oval form, composed of earth and the gnawed fragments of other materials, agglutinated by a viscous secretion which exudes from its body. These larvæ seek their food in the dung of cattle, in tan-pits, in gardens where rich vegetable mould occurs, and among the roots of plants. In regard to their interior structure, it has been observed, that the nervous system, when studied in the different stages of life, presents a considerable dissimilarity. The ganglions are less numerous, and approximate more to each other when the insect has reached the term of its final transformation, and the two posterior ganglia throw out numerous filaments disposed in a somewhat radiated form. In the larva the trachea is elastic, but simply tubular in the perfect insect. The structure of the eye in most of the lamellicorn beetles exhibits characters analogous to those of the Tenebrionites, the Blattæ, and other lucifugous or light-shunning species.

The alimentary canal is of great length, especially among the coprophagous kinds, and the chylific ventricle is beset with papillæ, which, according to the investigations of M. Dufour, serve as the receptacles of the alimentary fluids. The biliary vessels resemble those of the carnivorous coleoptera in number and position, but they differ in being of greater length and much more slender.

FAMILY—GEOTRUPIDÆ.

The characters usually assigned to this family, have been deduced almost entirely from the examination of a few well known European species. The earlier definitions, therefore, if strictly applied, would exclude many genuine Geotrupidæ from their natural position. They differ from the Scarabæidæ (of Macleay), by their corneous mandibles, and from the Dynastidæ by their exserted labrum. But as these and other characters are subject to variation and gradation in the extreme genera, or such as approximate to the boundaries of other families, we need not be surprised even at their total disappearance in species to be yet discovered. The Geotrupidæ feed on excrementitious animal matter, and on decomposed vegetable substances, boleti, &c. A few of the less characteristic genera feed on roots. From Mr Macleay's observations on this Family, it appears that the proportions of the species from within the tropics,—from the temperate zones,—and from latitudes higher than 60°,—are to one another nearly as 2, 10, 1*. We may therefore regard them as characteristic of temperate climes.

Genus—GEÓTRUPES, *Latreille*. Named from *γη the earth*, and *τρυπαω to bore*, the species excavating cylindric holes in the earth under their food.—Antennæ inserted close to the eyes, under the clypeus; capitate, 1st joint long, clavate, pilose, 2d short, rounded, 3d longer, 4th and 5th rather shorter than the 3d, 3 following somewhat cup-shaped, compressed, the 3 last dilated, transverse, forming an ovate lamellated club (Pl. 1. fig. 22.): maxillary palpi with the last joint of the same length as the preceding, or rather longer, subcylindric truncate: labial, with the two last joints of nearly equal length: mandibles standing out from the head, emarginate at the apex, the internal side coriaceous and pubescent: eyes divided by the margin of the head, and touching the thorax: the latter as broad as the elytra, very convex, nearly semicircular, and margined all round: elytra short, oval: anterior tibiæ dentate externally; the others notched; tarsi slender, 1st joint minute, unguicular one longest.—*Lat.* ii. 91. *Curtis, B. E.* vi. 266.

G. sylváticus.—Black, violaceous beneath, disk of the thorax with scattered punctures, elytra faintly striated, the interstices with cross wrinkles. 7–8½.—*Fab. Don.* 16. 546, 2.

Body nearly hemispherical, shining black above, margins of the thorax violaceous: head rugose, with an acute tubercle on the forehead, the margins elevated, and an angular ridge before the eyes: disk of the thorax with thinly scattered rounded punctures, the lateral margins rugosely punctate; the dorsal line is generally obsolete, except behind, where it is sometimes rather deeply impressed, and there is a fovea on each side near the margin: scutellum with a longitudinal impression: elytra not very regularly, and rather obsoletely striated, somewhat rugulose: body beneath, and legs, hairy, violaceous, or steel blue, highly polished and resplendent, sometimes golden-green.

Not very frequent near Edinburgh, but rather plentiful a little further south. Near Dreghorn. Fields south of Portobello.

G. stercorárius.—Black, violaceous beneath, disk of the thorax impunctate, elytra deeply striated, the striæ with impressed punctures, the interstices smooth. 8–9½.—*Scar. stercorarius, Linn.*

Larger than the preceding, oblong-ovate, black above, the margins tinted with violet or brassy: head and antennæ similar: thorax impunctate on the disk, with an impressed line in the middle behind; the lateral margins and anterior angles having a few scattered punctures: elytra with deep striæ which are somewhat punctured, the interstices smooth and slightly convex; under side and legs steel blue, glossed with purple or green.

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* *Hor. Ent.* part 1. p. 52.

A common insect in this neighbourhood, and throughout the country. Most plentiful in the spring and autumn.

It is curious to observe the different devices made use of by insects to deceive their enemies. While the Byrrhidæ and several other tribes, contract their limbs, so as to give themselves the appearance of a little ball of inert matter, the species just described pursues an opposite plan, and sticks out its legs at full length, where it holds them perfectly still and rigid, so as to produce an appearance as if it had been for some time dead. It is thus supposed to deceive the cunning rook and other birds, which value it only as a living prey.

G. vernalis, distinguished from the last-named species by its bluish-black colour, thickly and minutely punctured thorax, and faintly punctate-striated elytra, is not common in Scotland, but occurs occasionally in hilly districts. Ben Lomond. Cheviot Hills. *G. lævis*, characterised by the smoothness of its elytra, was taken by Mr Wilson at Dunkeld, and in Argyllshire by W. C. Trevelyan, Esq. younger of Wallington.

FAMILY—APHODIIDÆ.

The *Aphodiidæ* differ from the Scarabæidæ of Macleay, in having short dilated coriaceous mandibles, and by their pairs of feet being at equal distances from each other. They are likewise distinguished from the following family of Trogidæ, by their labrum being concealed under the clypeus, and by their mandibles being thin, compressed, and scarcely corneous. The scutellum is distinct in all the species. They are the least of the petalocerous coleoptera, and although they closely resemble each other in general structure, they differ widely in their mode of life. Some are coprophagus, while others prefer vegetable matter, for the most part marine, in a state of putrescence.

"Of all the Saprophagous Petalocera," Mr Macleay observes, "the *Aphodiidæ* are the most common in England, and seem to replace with us the want of Scarabæidæ. They appear indeed to be equally frequent over the whole of the north temperate zone, and I have made out the proportion of tropical insects of this family to be to those from countries without the tropics, as 1 : 8. None have hitherto been brought from New Holland, though we are acquainted with Aphodiidæ from the Cape, which is nearly of the same south latitude. The coprophagous insects of New Holland, seem indeed to be principally composed of the genus *Onthophagus*, or of insects approaching to it, though even these occur but rarely. This rarity of coprophagous insects in New Holland, is of course the natural consequence of that great peculiarity of the Australian Continent, namely, the want of all large herbivorous mammalia, except of the marsupial kind. Still I have little doubt but that, if the marine detritus of the coast of New Holland were properly searched, we should acquire the knowledge of several insects approaching to *Psammodii* in habit*."

GENUS — APHÓDIUS, *Illiger*. From αφοδος, *dung*, which the species usually frequent. — Antennæ very short, inserted close to the eyes under the clypeus; 9-jointed, 1st joint longest, rather robust cylindric, 2d somewhat globose, 3d small, the remainder transverse, the 3 last forming an ovate lamellated club: maxillary palpi with the last joint longer than the penultimate, cylindric truncate: labial with the terminal joint longest, ovate: mandibles horny at the base, membranaceous, rounded and entire at the apex: maxilla terminating in a dilated lobe: clypeus or shield of the head semicircular, often tuberculated: thorax transverse quadrate: legs placed at equal distances; anterior tibiæ wide, and having three teeth on their external edge; 4 posterior tibiæ with two spines at their apex; tarsi very slender, the unguicular joint longest.—*Lat. Gen.* ii. 88. *Curtis, B. E.* i. 27.

This genus was established by Illiger at the expense of the old genus Scarabæus of Linnæus. The species are slow of movement on foot, but they fly with facility, and their appearance is interesting, as denoting the return of the delightful spring. They abound in most parts of Europe, and are frequent in the dung of cattle.

A. Fóssor.—Short, very convex, shining black, head with three tubercles, the central one longest and acute, elytra faintly punctate-striate. 5–5½ : 2½.—*Fab. Scarabæus Fossor, Linn.*

Oblong, very convex, entirely shining black: head faintly punctured, with three distinct tubercles in the middle, placed transversely, the central one longest and most acute, the clypeus slightly emarginate in front, with the edges bent upwards: thorax large, margined on the sides and behind, thinly punctured on the sides, the front with a rounded depression in the middle: elytra short, very convex, with faintly punctured striæ, the sutural one running obliquely at the base along the side of the scutellum, the four outermost scarcely parallel, and not reaching quite to the base: under side and legs thinly pubescent.

In the female the frontal tubercles are very minute, the surface of the thorax punctured throughout, and the fovea scarcely or not at all observable.

Plentiful throughout the summer and autumn in cow pastures, by road sides, &c.

A. hæmorrhóidalis.—Short, black, head with three tubercles, elytra crenate-striate, rufous at the apex. 2½–3.—*Fab. Gyllen. Scarab. hæmorrhoidalis, Linn.*

Very convex, shining black; head with three tubercles, the clypeus sinuated before the eyes: thorax large, very convex, the surface equal, and very closely punctured: scutellum large and rather elongate, punctured: elytra short and wide, rather deeply crenate-striate, the apex, and not unfrequently a spot on the shoulder, rufous: under side and legs pitchy-black, sparingly pubescent.

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* *Hor. Ent.* 1. p. 58.

In such places as the preceding, but seemingly rare. We have met with it in fields near Collinton, and in the irrigated meadows between Restalrig and the sea.

A. fimetárius.—Shining black, the anterior angles of the thorax and the elytra rufous. 2½–3½ : 1½–1¾.—*Scar. fimetarius, Linn. Marsh. Don.* xii. pl. 404. f. 1.

Head black, the clypeus with three tubercles, and a raised transverse line before them; palpi and antennæ ferruginous: thorax shining black, with the anterior angles rufescent, thinly punctured, and having in the males a pretty deep impression in the middle of the front: scutellum black: elytra red, punctate-striate, the 8th stria from the suture abbreviated anteriorly, the interstices punctulated; under side and legs black, tarsi rufescent.

In pastures and on highways, very common. It appears early in the spring, being often noticed on the wing in the beginning of March, and it is frequent in sheltered situations and on highways by the end of that month.

A. scybalárius.—Short and convex, shining black, head trituberculate, elytra punctate-striate and of a pale griseous colour. 2½–3.—*Fab.*

About the size of *A. fimetarius:* clypeus black, trituberculate, with an obsolete cross ridge in front; antennæ testaceous, the club blackish: thorax entirely shining black, rather thinly punctured, especially in the middle: scutellum black: elytra pale greyish, glossy, the striæ as in *A. fimetarius:* under side black; legs testaceous, often a little obscure.

Not very common. Salisbury Craigs. Near Libberton.

A. rufēscens.—Ferruginous-red, convex, the disk of the thorax very thickly punctured, legs entirely ferruginous. 2–2½.—*Fab. Gyllen.*

Variable in size, and of a considerably degree of convexity, ferruginous: head somewhat dusky on the crown, the clypeus with three tubercles; antennæ rather paler than the body: thorax with the entire surface thickly punctured, glossy black, the margins to a greater or less extent ferruginous, and marked with a dusky spot: elytra glossy, punctate-striate, most commonly unspotted, but sometimes having a considerable portion of the disk occupied by a patch of black: under side and legs ferruginous; the latter free from spots.

Salisbury Craigs and other places, occasional.

A. sórdidus.—Livid-testaceous, not very convex, the sides of the thorax black and thinly punctured, body and legs spotted with black. 2½–3½. *Fab. Gyllen. Scar. fimetarius, var. b. Linn.*

About the size of *A. fimetarius*, but narrower and depressed: head glossy black, the clypeus ferruginous and trituberculate: thorax wide, the disk glossy black, scarcely punctured, the margins all round pale, the sides with a black spot in the middle of the pale portion: elytra pale griseous, shining, the suture dusky black, and the disk occasionally marked with two black spots: under side and legs livid, variegated with black marks.

Not so common as many of the other species, but found not unfrequently.

A. conspurcátus.—Black, with the sides of the thorax pale, elytra likewise pale and marked with seven black spots. 2¼–2½.—*Gyllen.* *Cor. conspurcatus, Linn.*

Oblong, glossy: head black, with an oblong spot of a ferruginous colour before the eyes; the clypeus not emarginate in front, and bearing three tubercles: thorax convex, closely punctured, glossy black, with the sides pale and marked with an indistinct dusky spot: elytra not very convex, glossy, finely punctate-striate, of a pale hue with seven black spots usually of an oblong-quadrate form on each, two of which are placed between the 2d and 3d striæ, behind the middle, a third towards the base between the 3d and 4th, two others between the 4th and 5th, the 6th curved and oblique on the shoulder, the 7th elongate and pointed, situate near the middle of the elytra; under side and legs testaceous, somewhat griseous.

Not a very common insect apparently in any part of Britain. It has occurred sparingly in this neighbourhood.

A. stíctitus.—Shining black, head with a ferruginous spot before each eye, elytra griseous, spotted with black. 2¼–2¾.—*Sturm.* *Gyllen.*

Head and thorax glossy black; the clypeus not emarginate on the anterior edge, having three obsolete tubercles and a ferruginous spot before each eye: antennæ pale testaceous: thorax thickly punctured, the front and base narrowly, and the sides widely, margined with pale testaceous, the black portion projecting on each side, and forming a spot near the middle of the pale margin: elytra testaceous, somewhat griseous, deeply punctate-striate, the suture and striæ rather obscure; marked with a long black spot near the base, two others, usually united, in the middle towards the suture, and three others, forming a triangle within the apex; under side fuscous: legs pale.

Found in considerable abundance in this vicinity, flying about farm-yards, highways, &c. during the warm days of spring.

A. inquinátus.—Glossy black, the anterior angles of the thorax with a rufous spot, elytra griseous, marked with black spots, of which the two next the suture are formed by the confluence of three smaller ones. 2¼ : 1¼.—*Fab.* *Gyllen.*

Head and thorax glossy black; the clypeus very slightly emarginate in front and trituberculate; antennæ dusky black: thorax closely punctured over its whole surface, the anterior angles rufescent, but the sides not margined with yellow: elytra finely punctate-striate, pale griseous, with the suture and several spots black; one spot at the base, another apparently formed by the junction of three smaller ones, before the middle, a third of a similar appearance towards the apex, an oblong mark beneath the shoulder, and an inconspicuous crescent-shaped one within the apex: under side pitch-black; legs dusky-griseous.

Not unfrequent on wall-tops, &c. especially during spring and autumn.

A. terréstris.—Short and convex, glossy black, elytra dull black, punctate-striate, the interstices punctured; head with three tubercles. 2½ : 1¼.—*Illig.* *Gyllen.* *Scarab. terrestris, Fab.*

Resembles *A. Fossor* in the shortness and convexity of its form, but is scarcely one-fourth of the size: entirely deep black; head rather rugosely punctured, shining, with three tubercles, the clypeus somewhat emarginate in front; antennæ black, palpi pitch-black: thorax glossy, very convex, thickly covered with rather large round punctures: elytra dull black, punctate-striate, the 3d stria from the outer margin abbreviated anteriorly, the interstices pretty thickly punctured: under side and legs shining black, legs often pitch-black, especially the tarsi.

Rather common in grassy fields, &c. Arthur's Seat. Pentland Hills, &c.

A. melanopus.—Shining black, head rugose, trituberculate, elytra deeply punctate-striate, black, with the apex somewhat pale. 2 : ¾.—*Steph.*

Considerably less than the preceding, glossy black: head rugosely punctured, with three tubercles and a line across the front; clypeus slightly emarginate: thorax entirely black and thinly punctured: elytra black or brown-black, the apex usually pale, the striæ deeply impressed and the interstices therefore appearing convex: under side and legs pitch-black.

Occasional. Arthur's Seat, near the summit. Calton Hill, &c.

A. rúfipes.—Oblong shining pitchy-brown above, paler beneath, clypeus without tubercles, elytra striated, anterior tibiæ with three large teeth on their outer edge. 4½–5 : 2¼.—*Scarab. rufipes, Linn.*

About the size of *A. Fossor*, but more oblong, and not nearly so convex, shining brownish-black above; clypeus rounded, with an obsolete tubercle in the middle, the disk smooth, the sides punctulated; palpi and antennæ ferruginous: thorax sparingly punctured on the sides, the disk smooth: elytra thrice the length of the thorax, pretty deeply crenate-striate, two or three of the outer striæ scarcely reaching to the shoulder, the interstices very minutely punctulated: under side and legs ferruginous.

One of the most abundant of the coprophagous beetles, and may be found throughout the greater part of the year, wherever their pabulum occurs.

A. lúridus.—Somewhat depressed, glossy-black, thorax punctured, elytra either dull black or griseous, with black striæ and long patches of the same colour. 3¾–4½.—*Scar. luridus, Fab.*

Head and thorax glossy black and punctured, the former without tubercles: elytra punctate-striate, the interstices punctulated, of a rather dull uniform black colour, or griseous, having the striæ and considerable portions here and there of the interstices black: under side and legs black.

Not very plentiful in this quarter. Salisbury Craigs. Arthur's Seat &c.—*Mr James Stark.* "North of Sutherlandshire."—*H. C. Watson, Esq.*

A. merdárius.—Black, the anterior angles of the thorax and elytra testaceous-yellow, the latter with the suture black. 1¾–2 : ¾–1.—*Scar. merdarius, Oliv. Marsh.*

One of the smallest species of the genus: head and thorax shining black, punctulated, the former obsoletely tuberculated, the latter with the anterior angles yellowish: scutellum black: elytra testaceous-yellow, the suture black, and the lateral margins dusky at the base; punctate-striate, the interstices very faintly punctulated: under side black: legs and antennæ piceous.

This very distinct species is plentiful at times on the shore, and not unfrequent in most other places.

A. quadrimaculátus.—Shining-black, elytra punctate-striate, with a red spot on the shoulder and another near the apex. 1½.—*Scar. 4-maculatus, Linn. Don.* ii. pl. 70. f. 3. *Aph. 4-pustulatus, Fab.*

Small, short, and convex; head and thorax shining black, unspotted, thickly punctulate: elytra likewise shining black, punctate-striate, the interstices minutely punctulated, each with a small red spot on the shoulder, sometimes produced behind into a longitudinal streak, and another larger and of a deeper red towards the apex: under side, antennæ, and legs black; the tarsi rufescent.

Rare. We have seen a few specimens procured in the neighbourhood, but are unacquainted with their precise locality.

A. Sus.—Oblong, rather depressed, dull rufous, pubescent, elytra greyish, with two rows of black spots. 2–2¼.—*Scar. Sus. Fab. Scar. pubescens, Oliv.* 1. 91. pl. 24. f. 205. *a, b.*

Oblong, depressed, and rather narrow: clypeus truncate in front, punctulate, dull rufous, the crown dusky: thorax thickly punctulate, pubescent, of a rufous colour, with the disk and a spot on each side obscure: elytra rather elongate, greyish, pubescent, channelled, the interstices smooth and rather elevated, the 2d and 4th from the suture with a row of black subquadrate spots, some of them usually united: under side and legs dusky red, the thighs paler.

"Taken most abundantly by J. Rawlins, Esq. in a field by Ravelston Wood, near Edinburgh."—*Dr Leach in Steph. Illus.* We have not met with the insect ourselves.

GENUS—**PSAMMÓDIUS**, *Gyllenhal.* From *ψαμμωδης, sandy,* the species usually frequenting such places.—Antennæ inserted under the clypeus before the eyes, capitate; 1st joint longest, somewhat robust, 2d subglobose, 3d slender, pear-shaped, 3 following small, equal, cup-shaped, the remaining three forming a loose club, of which the terminal joint is ovate: maxillary palpi with the penultimate joint minute, the last long, subovate: labial with the last joint large, ovate: mandibles nearly quadrate, corneous: head rounded: thorax transverse, rounded on the sides: legs short, robust, anterior tibiæ compressed, and divided into three lobes externally; tarsi 5-jointed, slender.—*Gyllen.* i. 8. *Curtis, B. E.* vi. 258.

P. sabuléti.—Oblong, pitchy-black, head and thorax covered with large round punctures, elytra deeply punctate-striate, tarsi and anterior tibiæ ferruginous. 1¾–2 : ¾.—*Gyllen. Car. punctulatus, Marsh.*

Rather dull black, antennæ and trophi ferruginous: head without tubercles, punctate: thorax margined behind and at the sides, thickly covered with large round punctures: elytra convex, ovate, deeply punctate-striate: body beneath black: legs pitchy-black, all the tarsi and the anterior tibiæ ferruginous.

Var. b. Wholly pale ferruginous.

Not common. Under stones on the shore near Musselburgh. Banks of the Esk above Musselburgh. The variety has occurred but once in the last mentioned situation, and is probably occasioned by immaturity.

FAMILY—TROGIDÆ.

THE *Trogidæ*, though by no means so strongly characterised by the hand of nature as either the Scarabæidæ properly so called, or the preceding family of Aphodiidæ, may yet be distinguished without much difficulty by the lamellæ of the clava of the antennæ being convex on both sides, so that the three joints of which it is composed are always very distinct; whereas in the Geotrupidæ "the first and second joints of the clava are one or both infundibuliform, so that the whole becomes to the naked eye united under the form of a globular mass *." This family contains the smallest amount of species of all the Saprophagous Petalocera, and it seems to be distributed in nearly equal portions over temperate and tropical climates. It is, moreover, the only known petalocerous family which contains apterous species, and its presenting exceptions in respect to that dominating character, affords room for some curious and interesting speculations. The Trogidæ, in general, delight in cadaverous substances:—all insects intended to live on animal matter partially dispersed and collected in masses, are provided with wings, which convey them rapidly to the objects which they instinctively desire:—but the genus Phoberus of Macleay (*Trox horridus*, Fabricius) being destitute of wings, a doubt naturally arises as to the probability of its feeding like its congeners on dried cadaverous matter. It has been mentioned as an illustration of this point, that the genera Silpha, Hister, Dermestes, and other necrophagous insects, are winged, whilst Pimelia, Brachycerus, &c., which, like *Trox horridus* (Phoberus) frequent sandy deserts, are apterous,—a formation supposed to accord with the fact that the particles of which their food is composed, are so universally spread over these arid plains, as to obviate the necessity of a rapid and distant change of place †.

The European species are provided with wings, and are met with during spring and summer on the ground, in fields, and in rather dry and sandy situations. They are not unfrequently observed on the desiccated remains of animal substances, the tendinous portions of which are supposed to constitute their food. When touched, they contract the feet and antennæ, and for a time simulate the motionless aspect of death. We have scarcely any precise knowledge either of their larvæ or of their modes of transformation.

GENUS—ÆGIÁLIA, *Latreille*.—Antennæ longer than the head, 9-jointed, the radical joint cylindric and robust, 2d obconic, 3d rather slender and elongate, next three short and transverse, the remainder forming a lamellate club: maxillary palpi longer than the maxillæ, slender, the terminal joint elongate, attenuated to the apex: body short, very convex, or gibbous behind: legs short and strong; the anterior tibiæ with three teeth on their external edge, the posterior four with transverse elevated ridges; the last pair thickened, having the tibiæ armed with dilated spurs; claws very minute.—*Lat. Gen.* ii. 97.

This genus occurs on the sea-shore along with the *Psammodii*, to which it bears a striking affinity. In common with the latter, it is believed to feed on putrid sea-weed, and other littoral detritus. We are not acquainted with more than a single species, although we believe that the kingdom of Naples produces a second, known to collectors under the name of *Ægialia cornifrons*.

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* *Hop. Ent.* i. p. 61

† *Idem.* p. 62.

Æ. globósa.—Black above, very glossy, head granulated, elytra gibbous, with impunctate striæ. 2¼.—*Lat.* *Scar. globosus, Don.* xiv. pl. 470. *Psam. arenarius, Gyllen.*

Shining black above, glabrous; head granulated, palpi and antennæ ferruginous; thorax short, the hinder angles much rounded, very glossy, impunctate to the naked eye, but under a lense appearing thinly and minutely punctulated: elytra dilated at the middle, very convex, with rather faint impunctate striæ: under side of the body pitchy ferruginous, the sides fringed with long hairs; legs short, very rigid, pitchy.

Found on the shores of the Firth, occasionally. Near Fisherrow. "Sands between Leith and Musselburgh."—*Dr Leach.* *Steph. Illus.* It appears to be confined to the sea-coast.

FAMILY—MELOLONTHIDÆ.

The insects of which this family is composed, were included by Linnæus in his extensive genus *Scarabæus,* and they also continued to form a portion of that genus in the works of Geoffroy, De Geer, Schœffer, and other entomologists prior to the time of Fabricius. The last-named author established the genus *Melolontha,* which, in its extended signification, may be regarded as synonymous with the family now under consideration. Were we to follow the prevailing and praiseworthy example of botanists, who bestow upon a *family* the name of the *genus* by which it is most strongly characterized, our present group ought to be denominated *Sericidæ,* in as far as the type is not formed by *Melolontha vulgaris,* but rather by *M. brunnea* of Fabricius, which now constitutes the genus *Serica* of Macleay. But as it is at all times desirable that the families should be named after well-known genera, the designation now adopted is preferable to that derived from the less noted though more characteristic type. The *Melolonthidæ* are rarely distinguished by brilliant or metallic colouring. Their elytra are generally scaly or hirsute. Throughout the entire period of their existence these insects live on vegetable substances, and their ravages are often extremely injurious. The larvæ are very long-lived, and sometimes pass three or four years in that destructive state. In cold and temperate climates they are very sluggish, if not torpid, during winter, and descend somewhat deeper into the earth, to avoid the effects of frost. The perfect insects feed on leaves, the larvæ for the most part on roots.

GENUS—SÉRICA, *Macleay.*—Antennæ 10-jointed, 1st and 2d joints rather robust, the former clavate, the latter globose, 3d and 4th short subcylindric, 5th obconic, 6th and 7th cup-shaped, the latter indistinct, the lamellate club 3-jointed, narrow, and much elongate in the males: maxillary palpi with the terminal joint as long as the two preceding, cylindric, with the apex somewhat acute: mandibles short, thick, somewhat trigonate: thorax very short, transverse; the body short ovate, convex, with elongate elytra: legs slender, the tarsi very long, with the claws bifid at the apex.—*Horæ Entom.* part i. 146. f. 25.

S. brúnnea.—Testaceous-red, punctate, thorax with an obsolete dusky spot on each side, the elytra striated.—*Scar. brunneus, Linn. Scar. fulvus, De Geer*, iv. 277.

Rather long and narrow, entirely rufo-testaceous, slightly pruinose, or obscured by a kind of bloom resembling some of the tints of Labrador Felspar; the hinder part of the head and eyes alone blackish, the anterior part margined: thorax punctate, with a shallow, generally fuscescent, impression on each side: elytra long, rather soft and flexile, convex, furrowed, the furrows thickly punctate: legs long and slender, the tarsi much lengthened, with claws bifid at the apex, the upper tooth long and acute, the internal one broad, flat, and obtuse.

Not very unfrequent throughout the south of Scotland, concealing itself during the day in crevices of trees, among grass, and sometimes under stones, and flying about in the twilight. Banks of the Water of Leith. Figget Whins. Lasswade; *Miss H. Wilson*. June—August. We have received it plentifully from Aberdeen, Inverness, Argyll, Forfar, and the northern extremity of Sutherland.

GENUS—**MELOLÓNTHA**, *Fab.*—COCKCHAFER. Named from *μηλεα*, *an apple-tree*, and *ἄνθησις*, *inflorescence*.—Antennæ 10-jointed, the basal joint long, robust, obconic, 2d short, 3d elongate slightly clavate, the lamellate club consisting of six or seven joints (Pl. I. fig. 23.): maxillary palpi with the terminal joint longest, rather thicker than the others, the outer side convex; head elongate quadrate, with a reflexed margin, and a suture across the middle: thorax transverse, quadrate, narrowed in front, the sides dilated in the middle and rounded: anterior tibiæ dentate externally: tarsi slender, 5-jointed.

M. vulgáris.—Pitchy black, clothed with dense whitish pubescence, elytra entirely testaceous, the sides of the abdomen with a row of triangular white spots. 10–13.—*Scarabæus Melolontha, Linn.* &c.

Oblong, convex; head oblong-quadrate, with a reflexed margin anteriorly, the front rufescent, the hinder part pitchy-black, the surface punctured and clothed with long whitish hairs; palpi and antennæ ferruginous, the club of the latter much elongated, and composed of seven joints in the male; small, ovate, and 6-jointed in the female: thorax pitchy-black, punctured and clothed like the head, the hinder margin produced in the middle, the pubescence densest towards the sides, near each of which there is a longitudinal patch, of a whiter colour than the rest: scutellum black, punctured: elytra bay colour, covered with very short hairs, as if powdered with whitish dust, having four elevated lines on each, an elevation near the shoulder, and another near the apex: under side pitch-black, punctured, the thorax and breast with long brownish-white hairs, the abdomen with short hairs, the segments having a large triangular spot of white on each side: the portion of the abdomen protruding behind the elytra of a triangular form, deflexed, and narrowing regularly to a point: legs ferruginous, the hinder thighs sometimes pitch-black, the anterior tibiæ bidentate externally, and margined with black.

Comparatively rare in this part of Scotland, seldom more than a single individual occurring at a time, but it seems to be pretty extensively distributed over the country, specimens having been procured in the Park at Dalkeith House, near Lanark, Sorn in Ayrshire *, at Raehills and Moffat in Dumfries-shire, and as far north as Glencoe.

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* Professor Rennie, *Insect Transformations*, 225.

Μηλολόνθη, or Μηλάνθη, is a term of frequent occurrence in Aristotle and other ancient authors, and was first applied by Fabricius to the insects of the present genus. It is derived from the words mentioned above, because the insects it denoted either were supposed to be produced from the flowers of fruit trees, or were accustomed to resort to them for food. This circumstance renders it probable that the μηλολόνθη of the ancients belonged to the family *Cetoniadæ*, as the true *Melolonthidæ* are hardly ever seen on flowers; and the description of Eustathius, who says that the animal resembled a wasp, led Mr Macleay to conjecture that it might be the *Trichius fasciatus*, a vernal beetle common in Greece, which might be readily mistaken by a casual observer for one of the Hymenoptera, as it bears a considerable resemblance to some of the members of that order, both in its colouring and mode of flight. Moufet's investigations led him to a very different conclusion—that the insect was of a metallic green, and referable to the *Buprestridæ*. The former opinion is greatly the more probable, and accords with the brief notices on the subject found in ancient writers, particularly Hesychius and the scholiast on Aristophanes; but these notices are too imperfect to warrant the determinate application of a word obviously used with considerable latitude of meaning, and intended, in all probability, to indicate a group or tribe of insects, rather than any individual species *.

We may observe, that the existence in the perfect state of the species above described, is of very short duration. The life of an individual is supposed not to extend beyond a week, and the entire species, during each successive season, prevails only for the space of a single month. The male speedily perishes after the sexual union; and the female merely survives for a sufficient time to deposit her eggs in safety. As soon as the latter is fecundated, she digs a hole in the earth of about half a foot in depth, by means of her dentated fore legs. The larvæ which proceed from these eggs are soft, lengthened, of a dingy white or yellowish colour: they have six short scaly feet, a large scaly head, two antennæ, each composed of five pieces, and nine stigmata on each side of the body. The eyes are not at first visible, being concealed under the skin, which is ere long cast off. These destructive creatures feed upon the roots of various plants. They are most voracious during the summer season. In the course of the autumn they descend into the earth, and pass the winter in a state of profound repose, neither requiring nor desiring food. As soon as the solar rays produce their genial influence in early spring, they ascend within six inches of the surface, and recommence their ravages. They change their skin every year, assume the nympha state in the course of the third autumn after they are hatched, and appear in the perfect state during the ensuing spring or early portion of summer. The beetle, when it first escapes from its cocoon, is pale and soft, and does not venture to leave its subterranean chamber for some time. But, ere long, it acquires a firm consistence, and crawling to the surface, it expands its wings, and, mounting into the air, is henceforward no more a subterranean dweller, but seeks its nourishment among the umbrageous branches of the loftiest trees [*].

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* *Horæ Entomologicæ*, part i. 70.—Moufeti, *Theat. Insect.* xxi. 158.

Although the generality of insects are more destructive in the larva than in any other state, great ravages are occasionally committed even by the perfect insect. It is in relation to the present species that Mouffet records the number of beetles which at one time fell into the Severn as being sufficient to stop the wheels of the water-mills. In the year 1688, they covered the hedges and trees of a district of the county of Galway in such infinite numbers, as to hang in clusters like bees when they swarm. When on the wing, they almost darkened the light of day, and produced a peculiar sound by the rustling of their wings. When feeding, the noise of their jaws might have been mistaken for the sawing of timber, and in a very short time the foliage of the trees for miles around was so totally consumed, that, at midsummer, the country wore the aspect of the leafless winter [†].

"One of the worst of these ravagers," say Messrs Kirby and Spence, "is the grub of the common Cockchafer. This insect, which is found to remain in the larva state for four years, sometimes destroys whole acres of grass, as I can aver from my own observation. It undermines the richest meadows, and so loosens the turf, that it will roll up as if cut with a turfing-spade. These grubs did so much injury about seventy years ago to a poor farmer near Norwich, that the Court of that city, out of compassion, allowed him £25; and the man and his servant declared that he had gathered eighty bushels of the beetle [‡]. In the year 1785, many provinces of France were so ravaged by them, that a premium was offered by the government for the best mode of destroying them. They do not confine themselves to grass, but eat also the roots of corn; and it is to feast upon this grub more particularly that the rooks follow the plough [||]."

The scarcity of this species (*M. vulgaris*) in our district, saves it from the fate often inflicted in the south, where *spinning* a cockchafer is a favourite amusement among schoolboys. When the larger Coleoptera fall upon their backs, they have some difficulty in resuming their natural position; and in Sweden, according to Sparmann, there is a fond belief among the simpler of the common people, that their sins will be forgiven them if they set a cockchafer upon its legs. If this creed be true, our English youths have much to answer for [§].

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[*] Some very laborious and beautifully elaborated works have been recently published on the anatomical structure of the *Melolonthæ*. See more particularly "Considérations générales sur l'Anatomie Comparée des Animaux articulés, auxquelles on a joint l'Anatomie descriptive du Hanneton," par M. Straus. 1 tom. 4to, avec Planches. Paris, 1828. The illustrious and lamented Cuvier has observed of this production, that it is the only work fit to be compared to that of Lyonnet, *Sur la Chenille de Saule*. M. Dufour has also explained the digestive system of these insects in the 3d volume of the *Ann. des Sciences Nat.*; while the muscular economy of the wings and thorax has been described and figured by the accurate Chabrier in his "*Essai sur le Vol des Insectes.*" Paris, 1828.

[†] *Phil. Trans.* xix. 741. [‡] *Ibid.* 1741, 581. [||] *Introduct. to Entomol.* vol. i. p. 177.

[§] We may here note, that the *Melolontha Hippocastani*, Fab. (Olivier, i. 3. *a*, *b*, *c*.) was taken by Mr Wilson some years ago on the banks of Windermere. It was formerly confounded

GENUS—**PHYLLOPÉRTHA**, *Kirby*. From φυλλον, *a leaf*, and πεϱθω, *to destroy*.—Antennæ 9-jointed, the radical joint long and clavate, 2d subglobose, two following nearly equal in length, 5th shorter, 6th transverse, the remainder forming an elongate lamellate club: maxillary palpi with the terminal joint considerably longest, and most robust, the apex truncate: clypeus entire in front: body covered with long hairs: thorax a little narrowed behind, the sides rounded anteriorly and dilated: elytra rather depressed, not covering the apex of the abdomen: 4 anterior claws unequal, one of them undivided, the other larger and bifid; posterior pair not divided, rather unequal.—*Steph. Illus.* vol. iii. 224.

P. Hortícola.—Greenish or blue-black, thinly clothed with long hairs, elytra testaceous, with rather irregular lines of large punctures. 4–5.—*Scar. Horticola*, *Linn. &c.*

Ovate, rather flat above, with long hairs, rather thinly placed; head and thorax bluish-black, sometimes greenish, the former with the clypeus margined and very thickly punctured, the latter more thinly punctured, and slightly sinuated at each side behind; antennæ and palpi pitchy-black: scutellum large, triangular, the colour of the thorax: elytra rather flat, the shoulders prominent, of a deep testaceous colour, the suture and outer margin at the base narrowly black or blue-black, the disk coarsely punctate-striate, with long erect hairs issuing from the punctures: under side and legs bluish-black, villose.

Not common near Edinburgh. Pentland Hills. Shore east of Musselburgh. It is frequent in Aberdeenshire, Argyllshire, and many other parts of the Highlands.

P. Frischii is considerably larger than the above, of a glossy green, tinted with brassy, the sides of the thorax pale, and the elytra pale testaceous, glossed with green. It has been found on the banks of the South Esk, near Montrose.

The only other insects belonging to this family known to us as inhabitants of Scotland, are *Platycerus caraboides*, which has been taken in Aberdeenshire; and *Trichius fasciatus*, which "occurred on the flowers of the thyme near Loch Rannoch, in July."—*Curtis*.

SUBSECTION—V.

FAMILY—ELATERIDÆ.

This numerous and prevalent family corresponds to the undivided genus *Elater* of Linnæus. The species are easily recognised by their narrow, elongated, and flattish form, and by the sternum being prolonged to a sharpish point or spine. On examining the living species, the use of the last-named organ becomes obvious. The legs are very short, and when the creature falls upon its back, which it frequently does while dropping from a plant to the ground, it can

with *M. vulgaris*, but is distinguished by being rather smaller, shorter, and more convex; the elytra are narrowly margined with black, and the terminal style of the abdomen is rather shorter, and has a slight constriction or neck, which makes the extremity appear broader and more obtuse. It does not seem to be known as British to the English collectors.

only assume its natural position by springing upwards, which it is enabled to do by bringing the projecting point into sudden contact with a groove situated in front of the mesosternum. The *Elateridæ* occur in flowers, on various plants, and on the ground. We owe to De Geer the description of the larva of one species (*undulatus*). It is long, nearly cylindrical, provided with small antennæ, palpi, and six feet. Its body consisted of twelve scaly segments, of which the posterior was covered by a circular plate, furnished with two blunt points curving inwards; underneath was a large fleshy mammilla, which seemed to serve the office of a foot. The larvæ of *Elater striatus* are said to do much injury, by attacking the roots of wheat. The grub known in this country under the name of wire-worm, is an *Elater* in the early state. It lives under ground for several years, feeding on the roots of grain and vegetables. It is partial to land newly broken up, and does great damage in gardens recently converted from pasture land. In the year 1813, according to Mr Spence, this larva destroyed the greater proportion of the annuals sown in the Botanic Garden of Hull. In such cases, Sir Joseph Banks recommended that slices of potatoes, stuck upon skewers, should be buried near the seeds, and examined and cleared of the wire-worms from time to time.

M. Leon Dufour has studied the anatomical structure of several species of this family. In the number, length, and mode of insertion of the hepatic conduits, they shew a resemblance to the *Carabidæ*. The digestive canal is seldom more than once and a half the length of the body. Immediately succeeding an œsophagus so short as to be included within the region of the head, there is a small smooth conical cross, which seems to have escaped the observation of Ramdhor. The chylific ventricle is bilobed in certain species. The family is very extensive, both in exotic and European species, and now consists of numerous genera. Some of the American species are remarkable for the fine phosphoric light which is observed to emanate from them during the evening twilight, and when the shades of night have fallen upon the forests. One of these had the fortune to be transported to Paris under the form of nymph or larva, and having made its escape into the streets after the assumption of the perfect state, it greatly astonished the inhabitants of the Fauxbourg St Antoine.

GENUS—ELATER, *Linn.*—Antennæ shorter than the head and thorax, sometimes of the same length, and occasionally a little longer; filiform, 1st joint robust and rather long, 2d and 3d shorter, and more slender than the others, sometimes nearly globose, the remainder obconic, and generally produced on the inner side, making it appear serrated, terminal joint ovate: palpi with the terminal joint *dilated*, and triangular: maxilla divided into two processes: body elongate, linear, depressed: thorax with the hinder angles produced and acute: sternum furnished with a strong spine, which is received into a groove at the base of the abdomen: legs rather short; tarsi 5-jointed, the joints not divided, the terminal one clavate.

E. holoseríceus.—Brownish-black, with short griseous pubescence, forming irregular transverse patches, legs dull chesnut colour. 5–5½ : 1¾–2. —*Fab. Marsh.*

Head rounded, slightly impressed in front, and clothed with silky griseous pubescence, beneath which the surface is punctured; antennæ black, short, when bent backwards not reaching to the hinder margin of the thorax; the latter slightly dilated on the sides anteriorly, the hinder angles produced into an acute triangle, and marked with an elevated line; the disk very convex and equal, punctured and clothed with yellowish-brown pubescence, patches of which lie in different directions, making the surface appear variable in colour, by reflecting the light unequally: scutellum large and rounded: elytra about the width of the thorax at the base, somewhat dilated near the middle, with slightly punctured striæ, and pubescence like that of the thorax, forming transverse patches: under side brown-black, punctured and finely pubescent: legs castaneous, the tarsi palest.

Not very common, but occurring occasionally in most parts of the country. King's Park, Arthur's Seat, &c.

E. murínus.—Brownish-black, clothed with short griseous pubescence, variegated with white, tarsi and antennæ chesnut colour. 5½–7 : 2¼-2½. —*Linn. Fab. Marsh.*

Usually larger and proportionably wider than the preceding, of a brown-black colour, densely clothed throughout with griseous pubescence, which is variegated by the intermixture of white hairs: head with a triangular impression anteriorly; antennæ not reaching to the base of the thorax, robust, compressed, and of a ferruginous colour, the enlarged radical joint blackish: thorax with the hinder angles slightly produced, the centre channelled, especially behind, and a large posterior fovea on each side: scutellum rounded: elytra punctate-striate, the interstices punctulated, the surface variegated with brown and white pubescence: under side with brownish-ash pubescence, and a small spot of white at the side of each segment; legs piceous, the tarsi ferruginous.

Rather scarce: near Caroline Park, and in the vicinity of Dalkeith.

E. minútus.—Linear, elongate, black, pubescent, thorax oblong, thickly punctured and glossy, elytra and legs rather dull black. 3 : ¾.—*Linn. Marsh. E. angustus, Herbst.*

Small, narrow, slightly depressed on the elytra, entirely black, the head and thorax rather glossy, the elytra somewhat duller, the surface punctured throughout and covered with long pubescence: head with the frontal margin nearly straight and a little reflexed, the forehead marked with a shallow unequal impression; antennæ rather long, extending to the hinder margin of the thorax, or a little beyond it in the male, the colour black, the lower joints somewhat glossy: thorax longer than wide, nearly linear, the hinder angles slightly produced and not very acute, the disk convex, glossy black, not very thickly punctured, and having long pubescence: elytra linear-elongate, with striæ composed of oblong punctures, rather deeply impressed, the interstices flat and obsoletely but pretty closely punctulated: under side and legs black, glossy and pubescent, the tarsi fuscous.

This species appears to be rather scarce in all the more northern parts of Britain. It is found occasionally in this neighbourhood and in other parts of the south of Scotland in grass fields and meadows, generally in the vicinity of woods. Braid woods. Fields at Slateford. Pentland Hills.

GENUS—**CATÁPHAGUS**, *Steph.* From *καταφαγω*, *I devour*, in allusion to the destructive propensities of the larvæ.—Antennæ about the length of the head and thorax, or a little longer, rather slender, 1st joint long and robust, the remainder obconic and equal in length, except the 2d and 3d which are rather shortest, and the terminal one which is longest, elongate-ovate: head deflexed, much retracted, and very convex: thorax likewise very convex: in other respects as in the preceding genus.

C. obscúrus.—Short and very convex, dull brownish-black, pubescent, elytra with punctured striæ placed at equal distances, antennæ and legs dusky testaceous. 4–4½ : 1¼–1½.—*El. obscuris, Linn. Marsh. E. variabilis, Marsh.*

Body rather short, thick, and very convex, of an obscure dusky or brownish-black colour, and clothed with griseous pubescence: head retracted and reflexed, convex and thickly punctured; antennæ and palpi dull ferruginous: thorax widely emarginate in front, rounded on the sides and narrowly margined, the hinder angles prominent and acute; the surface very convex, punctured like the head, and impressed with a short central line at the base: elytra often of a paler hue than the rest of the body, convex, not very deeply punctate-striate, the interstices thickly punctulated; under side black, somewhat shining, punctured and pubescent; legs dusky ferruginous.—The antennæ, elytra, and legs are not unfrequently of a testaceous colour.

A common insect throughout the country. Under stones in the King's Park and in other places, abundant.

C. lineátus.—Fuscous, pubescent, elytra with punctured striæ disposed in pairs, griseous-yellow, the alternate interstices dusky; antennæ and legs testaceous. 4–4½ : 1¼.—*El. lineatus, Linn. Marsh. E. striatus, Fab. E. Segetis, Bierkand. Gyllen.*

Rather more elongate and scarcely so convex as the preceding insect, but resembling it so closely in most other respects, that it may be taken for a variety: antennæ and palpi ferruginous: thorax shaped as in *C. obscurus*, the colour usually dusky-black, inclining to ferruginous, the anterior margin and hinder angles always ferruginous, the disk very convex and punctured, the lateral margins nearly straight: elytra with punctured striæ which approximate in pairs, and unite at the apex, the interstices minutely punctured; the colour griseous-yellow, the narrow or alternate interstices dark brown or fuscous: under side dusky, pubescent, the edges of the abdomen ferruginous: legs testaceous.

By no means of such frequent occurrence as the preceding, but found occasionally in similar situations. King's Park. Braid Hills, &c.

The name of wire-worm, bestowed on several larvæ, is more correctly applicable to the early state of this species. Its history has been given in the Stockholm Transactions for 1777 by Mr Bierkander. This larva, which he calls *root-worm*, measures when full grown about seven lines in length; it is very narrow, of a yellow colour, shining, and hard; the head is brown, the extremity of the jaws black. The body is composed of twelve segments, on the last of which are two indented dark coloured specks. The anterior segments have six scaly feet. It is said to remain five years in the larva state, from which it issues as an elater, the *E. segetis* of Bierkander, supposed to be synonymous with *E. lineatus* of Linn.

Great damage is often occasioned by the wire-worm to the turnip crops. An instance is recorded by Messrs Kirby and Spence of a field in which it had destroyed one-fourth of the crop, and the owner calculated his loss at £100. He one year sowed a field thrice with turnips, which were twice wholly, and the third time in great part, cut off by this destructive insect.

C. limbátus.—Black, pubescent, elytra testaceous, with the suture and lateral margins dusky, antennæ and legs pale ferruginous. 2.—*Fab. E. nitidulus, Marsh.*

Small and narrow, nearly linear: head black, rather shining and punctured; antennæ wholly pale ferruginous and pubescent: thorax rather widest in front, where it is very convex, the sides not margined, and the hinder angles prominent, punctured like the head and pubescent, black with the anterior edge pale: elytra attenuated to the apex, deeply punctate-striate, of a testaceous colour, the suture and the outer margin brownish-black: under side black, the tip of the abdomen testaceous; legs pale ferruginous.

In woods and grass fields, not unfrequent. On one occasion we observed it in very great profusion near Rosslyn on *Galium cruciatum*, Crosswort. Braid Wood. Duddingston, &c.

C. marginátus.—Pitch-brown, the margins of the thorax, antennæ, and legs ferruginous, elytra testaceous, the suture and outer margin dusky. 3 : ¾.—*Elater marginatus, Linn. Gyllen. E. suturalis, Marsh.*

Head black, covered with large punctures and short hairs: mouth and antennæ ferruginous: thorax with the sides nearly straight, and having a very narrow margin, the hinder angles a little projecting, the surface punctured like the head, of a reddish-testaceous colour, the centre more or less blackish: elytra much elongated and nearly linear, the apex rounded, punctate-striate, and having the interstices strongly punctured; the suture, and generally a narrow streak along the outer margin behind, dusky black, the rest pale testaceous; under side pitch-black, the apex and sides of the abdomen testaceous: legs pale ferruginous.

In such places as the preceding, not scarce.

GENUS — HYPNÓIDUS, *Dillwyn.*—Antennæ scarcely longer than the thorax, the radical joint very thick, 2d, 3d, and 4th obconic, nearly equal, the remainder somewhat heart-shaped, slightly diminishing in length to the terminal joint, which is indistinctly truncated obliquely: head standing out: thorax wider than long.—*Steph. Illus.*

H. ripárius.—Brassy-black, with short brown pubescence, elytra with impunctate striæ, legs testaceous-red. 2¾–3 : 1–1¼.—*E. riparius, Fab. Gyllen. E. aeneus, Marsh.*

Wide, brownish-black, glossed with brass, shining, and thinly covered with brown pubescence; head punctured and rather unequal; antennæ black, often testaceous at the base: thorax very wide, convex, the sides rounded and margined, the surface thinly punctured, the hinder angles prominent and acute: elytra about the width of the thorax at the base, attenuated behind, with regular impunctate striæ, which are most deeply impressed at the base: under side pitch-black: legs pale reddish, the thighs usually dusky.

One of the most plentiful individuals of the family, found beneath stones in all varieties of soil. Fields at the bottom of the Pentland Hills. Banks of Water of Leith. All around Edinburgh. It is equally common in other parts of Scotland. "Glen Clova, and Sutherlandshire," *H. C. Watson, Esq.*

H. quadripustulátus.—Black, pubescent, thorax with a smooth line down the middle, elytra with fine impunctate striæ, two spots on each, and the legs pale yellowish. 1¼–1½.—*Steph.* *E. quadripustulatus, Gyllen.*

A very minute species, the smallest of the family hitherto observed in this neighbourhood: black, slightly shining and pubescent: head punctured, mouth testaceous, antennæ black, the base testaceous, the 2d and 3d joints smallest: thorax with its diameters nearly equal, punctured and pubescent, the sides rounded and distinctly margined, the hinder angles prominent and acute, having a narrow slightly elevated smooth line down the centre: elytra somewhat wider than the thorax, impressed with fine impunctate striæ, the interstices nearly free from punctures; each elytron with a yellowish spot on the shoulder, and a smaller one near the apex: under side black: legs pale yellow.

Under stones on the sandy banks of the Esk above Dalkeith, and elsewhere in similar situations, but nowhere common. A variety without yellow spots on the elytra likewise occurs.

Two other species, which bear a considerable resemblance to the above, have been found in the more southern counties of Scotland: viz. H. agricola, and H. Dermestoides.

Genus—**SELATÓSOMUS**, *Steph.* From *σελας splendour*, and *σωμα body.*—Antennæ not reaching to the base of the thorax, the radical joint robust and clavate, slightly bent, 2d very short, 3d and 4th rather longest, obconic, remainder likewise obconic, nearly equal, terminal rather long, with the apex acute: thorax margined: elytra rather widest behind the middle.

S. áeneus.—Brassy-black, tinged with blue, green, or purple, antennæ black, legs dusky-black, sometimes rufescent. 6–7 : 2–2¼.—*E. aeneus, Linn. E. impressus, Marsh. E. cyaneus, Sowerby, B. M.* pl. 1, f. 26. *Samou. Comp.* pl. iii. f. 7.

Brilliant brassy-black, frequently tinged with beautiful tints of green, purple, and violet: head usually brassy, thickly covered with rather large punctures, the surface not very equal; antennæ black: thorax a little narrowed behind the head, the sides margined, the hinder angles long and pointed, with an acute ridge above, the surface moderately convex, smooth and glossy, pretty thickly and equally punctured, and usually impressed with two small foveæ before the middle: elytra nearly the breadth of the thorax at the base, the humeral angles rounded, dilated rather behind the middle, smooth, glossy, and impressed with deep indistinctly punctured striæ, the interstices punctulated: under side generally similar in colour to the upper surface; legs dusky-black, sometimes reddish, especially in individuals of a bluish colour.

This beautiful species is not generally distributed, being very rare in the neighbourhood of London, and occurring but sparingly in many parts of England. It is likewise rather scarce in Scotland, except in some particular localities. It abounds in this vicinity on Arthur's Seat, Salisbury Craigs, Blackford and Braid Hills, but is not very frequent in other places. "North of Forfarshire," *H. C. Watson, Esq.*

Subgenus—CALÓDERUS, *Steph.* From καλος, *beautiful*, and δερη, *the neck.*—Antennæ placed near each other at the base, 1st joint not long, robust, 2d very short, 3d and 4th longest, equal, the remainder shorter, terminal elongate-ovate: palpi short: thorax very gibbous, not margined on the sides.

C. Equiséti.—Black, covered with cinereous pubescence, base of the thighs and tarsi somewhat testaceous. 3½–4½.—*E. Equiseti, Herbst. Gyllen.*

Rather short, black, clothed with cinereous pubescence: head and antennæ black, the former impressed on the forehead, scarcely punctured: thorax widely emarginate in front, the sides rounded, but not margined, the disk convex, slightly shining, having a scarcely perceptible channel in the middle: scutellum with an impressed line down the centre: elytra somewhat wider at the base than the thorax, slightly depressed, punctate-striate, the interstices smooth: under side black; the spine of the sternum armed with a minute tooth at its apex: legs pitchy, the base of the tibiæ, and the tarsi usually pale.

Rare: woods near Mortonhall. "Near Edinburgh," *Steph. Illus.*

Genus—CTENÍCERUS, *Lat.* From κτεις, *a comb*, and κερας, *a horn*, in allusion to the conspicuously pectinated antennæ of the males.—Antennæ about the length of the head and thorax or longer, the radical joint robust, 2d small globose, the remainder pectinated in the males, or having a long linear projection from their inner side, acutely serrated internally in the female, the terminal joint elongate, acuminated (Pl. I. fig. 24.): body elongate, thorax longer than broad: elytra attenuated to the apex.

C. pectinicórnis.—Shining brassy green, thorax deeply channelled, elytra punctate-striate. 7–7½ : 2–2½.—*E. pectinicornis, Linn. Marsh. Don.* x. pl. 356. f. 2.

Entirely brassy-green: head thickly punctured, the forehead slightly foveolated; antennæ black: thorax elongate, rather widest behind, the surface pubescent, and covered with large punctures, having a wide deeply impressed channel down the middle, and the hinder angles very long and acute: elytra wider at the base than the thorax, considerably attenuated behind, rather faintly punctate-striate, the interstices minutely punctured, and very slightly pubescent: legs black, the tarsi usually fuscous.—The female is considerably wider than the male, and less elongate.

Seldom seen in the immediate vicinity of Edinburgh, but found occasionally among the Pentland Hills, at Rosslyn, &c. It begins to appear about the end of May.

C. cúpreus.—Head and thorax coppery, elytra yellowish at the base, the apex brassy-green or cupreous. 5–6½ : 1½–1¾.—*E. cupreus, Fab. Marsh.*

Considerably less than the preceding, very variable in colour: head and thorax usually coppery, sometimes purple or greenish, the surface of both thickly punctured and pubescent; the latter widely channelled down the middle, the hinder angles elongated and very acute: elytra attenuated to the apex, punctate-striate, with the interstices punctured, usually testaceous-yellow at the base, the apex for a greater or less extent cupreous or brassy-green; underside and legs glossy black, more or less tinted with brassy.

It occurs very frequently of a uniform coppery or brassy black colour.

Considerably more plentiful than *C. pectinicornis*, appearing on the wing during warm clear weather in many places round Edinburgh. King's Park. Braid and Pentland Hills, &c. May—July.

GENUS—ANÁTHROTUS, *Dillwyn.* From *αναθορεω, to rebound.*—Antennæ rather long and slender, deeply serrated, the radical joint long and robust, 2d shortest, sometimes globose, terminal longest and attenuated to the apex: body long and narrow, pubescent: tarsi with the 4th joint very minute, the three basal ones usually dilated.

A. níger.—Glossy black, covered with long fuscous hairs, elytra striated, the striæ forming furrows at the base. 5–6.—*E. niger*, *Linn. Oliv. E. aterrimus*, *Fab.*

The whole insect glossy black, and covered, especially on the upper surface, with long rather rigid fuscous hairs: head thickly punctured and slightly impressed: antennæ about the length of the thorax in the female, longer in the male, the 2d joint globose: thorax longer than wide, the sides rounded, the hinder angles much produced, the surface punctured and pubescent, the centre not marked with a channel: elytra of moderate length, somewhat wider than the thorax at the base, the apex rounded; punctate-striate, the interior striæ deeply impressed at the base, forming furrows; the interstices punctulated: under side shining, with long hairs; tarsi slightly piceous.

Hedge-rows, skirts of woods, and in corn-fields, pretty frequent throughout the Lowlands. Likewise frequent in the Highlands. "Inverary, Glen Clova, and Sutherlandshire."—*H. C. Watson, Esq.*

A. ruficáudis.—Fuscous black, thorax linear elongate, elytra brownish, the margins and apex of the abdomen deep ferruginous. 6½–7½.—*E. ruficaudis, Gyllen. E. sputator, Oliv. Don.* iii. pl. 96. f. 4. *A. hæmorhoidalis, Steph. Illus. Fab.* ?

Linear-elongate, obtuse behind: head black and pubescent, thickly punctured; antennæ dusky piceous, the 2d joint obconic, rather shorter than the following: thorax more than one-half longer than broad, of equal width throughout its whole length, the hinder angles short and obtuse, the surface thickly and minutely punctured and covered with depressed griseous hairs: elytra nearly linear, with the apex obtusely rounded, not very deeply punctate-striate, the interstices punctulated, the colour brownish of variable degrees of intensity: under side pitch-black, the margins of the segments and apex deep rusty red; legs dusky ferruginous.

Plentiful in woods, grassy places, and sides of fields, apparently throughout Scotland. It begins to appear about the middle of May.

GENUS—PERÍMECUS, *Dillwyn.*—Antennæ rather longer than the thorax, compressed and obtusely serrated, the radical joint robust, somewhat clavate, 2d and 3d minute, globose, the terminal joint longest, having its apex obtuse: elytra much elongated, narrowing gradually from the base to the apex.—*Steph. Illus.* vol. iii. 263.

P. fúlvipes.—Pitch-black, pubescent, antennæ dusky testaceous, legs ferruginous. 7–9.—*E. fulvipes, Herbst. Gyllen. E. castanipes, Payk. Marsh. E. obscurus, Fab.*

The largest of the Elateridæ occurring in this quarter: of a pitch-black colour above, shining, and covered with pretty long pubescence: head punctured, the forehead rather unequal; antennæ ferruginous, rather dusky: thorax narrowest in front, the hinder angles slightly prominent, covered with rather large punctures which are thickest on the sides, the base very indistinctly channelled in the middle: elytra wider than the thorax at the base, but becoming gradually narrower to the apex, much elongated, marked with striæ which are not very closely punctured, and the interstices remotely punctulated: under side pitchy, sometimes ferruginous: legs ferruginous.

A scarce species in Scotland: it has been taken in the decaying trunks of trees at Rossyln, and Lasswade. " Near Edinburgh," *Steph. Illus.* We have seen specimens from Dumfries-shire.

GENUS—APLOTÁRSUS, *Steph.* From *απλοος simple*, and *ταρσος tarsus.* Antennæ about the length of the thorax, serrated, the radical joint thickened, 2d nearly globose, or short obconic, 3d longer and more slender than the 4th, the remainder obconic, except the terminal one which is longest, and lanceolate-ovate: palpi with the terminal joint ovate, slightly truncate: elytra nearly linear; tarsi with the four lowest joints simple, the 4th longest.—*Steph. Illus.*

A. testáceus.—Head and thorax black, elytra and legs testaceous. 3¾–4.—*Steph. E. testaceus, Fab.*

Head and thorax black, slightly shining, minutely punctured and pubescent: scutellum dusky black: elytra scarcely wider than the thorax, slightly attenuated to the apex, entirely testaceous yellow, finely punctate-striate, the interstices thickly covered with small punctures and short hairs: under side dusky black, glossy: legs pale testaceous: antennæ brownish, with a tendency to ferruginous.

Sides of fields, and in woods, not frequent. Corn fields on the south side of Blackford Hill. Lasswade. Rosslyn. It is rare in England, and apparently still more so in Sweden.

A. rúfipes.—Oblong, glossy black, thorax immarginate, widest in the middle, elytra rather depressed, legs rufous. 3½–4 : 1–1¼.—*Steph. E. rufipes, Fab. Marsh. Gyllen.*

Upper surface glossy black, with short inconspicuous pubescence: head smooth and shining, scarcely perceptibly punctured; antennæ black: thorax rounded on the sides, and not margined, rather widest in the middle, glossy black above, scarcely punctulated: elytra rather long, scarcely wider than the thorax at the base, the apex rounded, the surface regularly punctate-striate, the interstices very indistinctly punctulated: under side glossy-black: legs pale rufous, the tarsi generally obscure.

Not unfrequent in upland pasture lands. Pentland Hills. Braid Hills. Dalmahoy. It is accounted a rare insect in England.

A. Qúercus.—Oblong, black, the elytra fuscous, tinged with green, legs dull testaceous, thorax smooth behind, the forehead roughly punctured. 3½.—*Steph. E. Quercus, Oliv.* tab. 6, f. 60, *a. b. Gyllen.*

Head black, deeply and ruggedly punctured on the forehead; antennæ black, the enlarged radical joint piceous: thorax rounded on the sides and margined, dull black, minutely punctured in front, but smooth behind: elytra linear-elongate, somewhat acuminated at the apex, dull fuscous with a greenish tinge, and thinly clothed with very fine cinereous pubescence; obsoletely striated, the interstices thickly granulated: under side black, somewhat shining and punctured: legs testaceous, the tibiæ palest, the tarsi generally dusky.

In woods, and grassy places, but rather scarce. Braid Hermitage. Woods at Cramond.

In addition to the above, the following Elateridæ are natives of Scotland.

Cataphagus sputator, Roxburgh and Dumfries-shires.

Elater brunneus, Near Loch Tay, Perthshire, *H. C. Watson, Esq.*

Elater serraticornis, Near the village of Denholm, Roxburghshire.

Elater cylindricus, Raehills, *Rev. Wm. Little.*

Elater balteatus, Peebles-shire.

Anathrotus vittatus, and Campylis linearis, have both been found, the latter in some abundance, at Raehills, by Mr Wm. Little.

SUBSECTION—VI.

FAMILY—CEBRIONIDÆ.

GENUS—ÁTOPA, *Payk.*—Antennæ longer than the thorax, filiform, the two first joints shortest, the rest conic-cylindric, rather increasing in length to the apex, the 3d being longer than the 4th: maxillary palpi rather long, filiform, 2d joint longest clavate, 3d half its length, 4th longer and broader, terminating somewhat obliquely; labial 3-jointed, 2 basal joints minute, 3d larger, obovate; mandibles lanceolate, with a tooth beneath the apex, the base dilated: thorax transverse, convex, as wide as the elytra behind, narrowed in front: tibiæ slightly clavate, with two spines at the apex; tarsi 5-jointed, the penultimate joint bilobed, terminal slender, clavate.—*Lat. Gen.* i. 252. *Curtis, B. E.* v. 216.

A. cervína.—Oblong-ovate, dusky-black, densely clothed with short hairs of an ash-grey colour. 4¾–5 : 2–2¼.—*Chrysomela cervina, Linn. Crioceris cervina, Marsh. Dascillus cervinus, Lat. Curtis, B. E.* v. pl. 216.

Entirely covered with short depressed ash-grey hairs, beneath which the body is blackish: head finely punctulated, with an elevation over the base of the antennæ: the latter dusky and pubescent: thorax margined on the sides, slightly sinuated behind, the angles acute: elytra scarcely wider than the thorax, rather widely margined, convex and punctured: under side and legs dusky, pubescent: the apex of the abdomen more or less ferruginous.

Var. b. Antennæ, elytra, and legs testaceous; in other respects the same as Var. a. Gyllenhal conjectures that this variety, which is of frequent occurrence, is the female.

Not so common near Edinburgh as it appears to be in some other parts of the country. Arthur's Seat: Mr Curtis. Rosslyn. It is found rather plentifully in the alpine districts of Scotland: we possess specimens from Craigcallioch, taken by Dr Greville, and have seen many from Glen Clova, Dunkeld, the neighbourhood of Ben Lomond, and numerous other places.

We are not acquainted with the history or transformations of this insect, but Mr A. Matthews has stated to Mr Curtis that while he was collecting Orchideæ in Kent, in the month of May, he found three specimens of *A. cervina* at the roots of *Orchis ustulata,* about four inches beneath the surface of the ground. This naturally induced him to suspect that the larvæ might feed upon these roots. Although it occurs in the western parts of France, the species may be regarded as characteristic of the north of Europe.

FAMILY—CYPHONIDÆ.

GENUS—CÝPHON, *Payk.* From κυφος, *hump-backed.*—Antennæ rather more than half the length of the body, filiform, the radical joint thicker than the others, and cylindric, 2d globose, 3d minute, remainder nearly equal in length: body ovate, or nearly rounded, rather soft, and clothed with fine pubescence: head small, and nearly concealed by the projecting front of the thorax, the latter rounded in front, the basal margin slightly sinuated: legs short and rather slender, the tibiæ without any conspicuous spines at the apex; tarsi 5-jointed, the penultimate joint bifid, terminal clavate.

C. melanúrus.—Oblong-ovate, testaceous, the apex of the elytra and abdomen fuscous, antennæ testaceous at the base. 2.—*Fab.* *Gyllen.* *Crioceris pallida, Marsh.*

Head testaceous, dusky on the crown; eyes large and black; antennæ black, testaceous at the base; thorax nearly semicircular, the hinder margin sinuated, the disk convex, punctured and pubescent, the colour entirely testaceous-red: elytra rather pale testaceous, the apex suffused with dusky, the surface convex, thickly punctured and pubescent: under side pitch-black, the apex of the abdomen testaceous: legs entirely pale testaceous or yellowish.

An individual occurs not unfrequently, having the vertex of the head, the suture and apex of the elytra, dusky black, which is considered by Gyllenhal to be a variety of C. melanurus, while it is regarded by Mr Stephens as a species, and is distinguished by the specific name *lætus* originally conferred on it by Panzer.

Not rare in woods and fields, especially during the autumnal months.

C. marginátus.—Ovate, dusky black, pubescent, base of the antennæ and tibiæ testaceous, the sides of the thorax widely margined with the same colour. 1½–2.—*Fab.* *Gyllen.*

Ovate, pubescent: head deflexed, punctulated, dusky: antennæ black, testaceous at the base: thorax obtusely rounded on the front and sides, the latter widely margined, faintly bisinuated behind, dusky black in the middle, the sides widely and the anterior margin narrowly testaceous: elytra oblong-ovate, convex, punctulated and pubescent, entirely dusky black; under side of a similar colour, the segments of the abdomen margined with pale testaceous; legs dull testaceous, the thighs black.

On plants in damp shady woods, rather rare. Cramond and Dalmeny.

C. pubéscens.—Ovate, dusky black, slightly pubescent, elytra, tibiæ, and thorax, griseo-testaceous, the latter very short and sinuated. 1½.—*Fab.* *Gyllen.*

Much less than the preceding, and more sparingly pubescent: head rather convex on the forehead, finely punctulated, black, the mouth somewhat testaceous: antennæ black, the three basal joints occasionally dull testaceous: thorax with two slight sinuosities before and behind, the sides deflexed and margined; rather convex, finely punctulated, and thinly clothed with very short rigid hairs, the colour greyish-testaceous; elytra of a similar hue, convex, with short scattered hairs: under side dusky-black, punctured, nearly free from pubescence: thighs blackish, the tibiæ and tarsi rather pale.

In shady woods and grassy places, not scarce. Woods by the side of the ater of [illegible] n. Woods at Craigie Hall, &c.

[illegible] Pá [illegible] *Little.*

FAMILY—LAMPYRIDÆ.

GENUS—LAMPÝRIS, *Linn.* λαμπυρις occurs in Aristotle, and is derived from λαμπω *to shine*, and πυρ *fire*, the insects to which it is applied being remarkable for their luminous properties.—Antennæ placed near each other at the base, filiform, rather shorter than the thorax, compressed, radical joint rather long, 2d very short, the remainder of nearly equal length, obconic-cylindric, the terminal one acute: maxillary palpi with the terminal joint ovate, acute at the apex: maxillæ divided into two lobes: mandibles entire: head bent beneath the projecting margin of the thorax: eyes very large, approximating: thorax semicircular: body depressed: legs short and compressed, without spines.—*Lat. Gen.* i. 258.

L. noctilúca.—Fuscous above, and rugosely punctured, the sides of the thorax cinereous. 5½–7½ : 1¾–2½.—*Linn.* &c. *Samou. Comp.* pl. 3. f. 1. male, f. 2. female.

Male. Of a uniform fuscous or black-brown colour above, except the sides of the thorax, which are cinereous: head minute, concealed beneath the projecting margin of the thorax: eyes large, globose, and black; antennæ the colour of the body or rather paler: thorax rugosely punctured, and covered with very short pubescence, the disk a little elevated, and of a black-brown colour, the sides and front depressed and cinereous, the margin itself reflexed, especially in front: elytra about five times the length of the thorax, linear, rugosely punctured and marked with three elevated lines, which are very obsolete posteriorly: under side rather of a paler hue than the upper surface, the sides of the terminal segments of the abdomen dirty yellow; legs fuscous.

Female. Head, antennæ, and thorax, nearly as in the male; abdomen destitute of elytra, depressed, and consisting of ten segments of a fuscous colour, except the terminal one, which is more or less pale.

The genus Lampyris belongs to that section of the Coleopterous Order called *Malacodermi* by Latreille, on account of the comparatively soft and flexible texture of which its genera are composed. The genus itself is exceedingly extensive, containing not fewer than sixty species. It is, however, poorly represented in Britain, and indeed produces but few European examples. If, as Mr Stephens supposes, *Lampyris splendidula* has been erroneously introduced into the British Fauna, then the subject of our present notice, the *Lampyris noctiluca* of Linnæus, may be regarded as the sole indigenous species.

In regard to the general history of these insects, we may observe that the Greeks applied the name of Lampyris, and the Latins those of Noctiluca, Luciola, &c., without any very special or discriminate reference, to such insects as were observed to shine during the night with a lambent or phosphoric flame. They were long confounded with Telephorus and Malachius, under the genus Cantharis. Geoffroy effected their separation from Telephorus, and placed them in the genus Lycus, while Linnæus also combined them with that genus and Pyrochroa. Fabricius was the first to restrict and define the genus Lampyris with propriety.

The beautiful light which emanates from this insect, constitutes its most interesting and important feature. If several ancient nations were worshippers of the sun, and regarded "holy light" as a divine effulgence, the offspring of heaven, and the purest of the elements, we need scarcely wonder, that in remote times, when natural phenomena were but slightly understood, even the more obscure manifestations of a supposed celestial principle, should have excited the wonder and admiration of mankind. We consequently find many exaggerated accounts of the cause and effects of these flying and creeping lights, which, as they do not illustrate the natural history properly so called of the insects themselves, we shall leave for the present unrecorded. But the actual phenomena are extremely interesting, on account both of their singularity and beauty, and without the aid of fiction, are well deserving the attention of the poet and philosopher. Huet, Bishop of Avranches, an eminent scholar, composed a poem entitled *Lampyris*; and the masterly genius of Wordsworth, which draws so much that is new and beautiful from the observance of common things, has not failed to immortalize the radiance of the "earth-born star." "And if," say Messrs Kirby and Spence, or one or other of these authors, while speaking of the British glowworm, "living like me in a district where it is rarely met with, the first time you saw this insect, chanced to be, as it was in my case, one of those delightful evenings which an English summer seldom yields, when not a breeze disturbs the balmy air, and hundreds of these radiant worms, studding their mossy couch with mild effulgence, were presented to your wondering eye in the course of a quarter of a mile, you would not help associating with the name of glowworm the most pleasing recollections. No wonder that an insect which exhibits itself on occasions so interesting, and whose economy is so remarkable, should have afforded exquisite images and illustrations to those poets who have cultivated natural history." However beautiful the effect produced by our own species, and by the fire-flies (*L. italica*), which are still more abundant over Italy, and the rest of the south of Europe, their splendour, according to Humboldt, cannot be compared in richness to those innumerable scattered and moving lights that embellish the nights of the Torrid Zone, and seem to repeat on earth, along the vast extent of the Savannahs, the spectacle of the starry vault of heaven. These, however, belong to a different tribe of insects, and merely resemble the glowworm, in their luminous properties.

The glowworm is now a very rare insect in the neighbourhood of Edinburgh. Mr Neill informs us that it formerly occurred between the city and the village of Canonmills, but we have not heard of its having been found there or elsewhere around our immediate suburbs for many years. Dr David Ritchie has observed it occasionally near Pathhead. Mr Wilson received some living specimens early last July, from Borthwick, about twelve miles from Edinburgh. They laid eggs a few days after their arrival, on the sides of a glass vessel. The parents soon after died, probably from being kept in too confined a space, but the young larvæ were hatched in a few weeks, and by the end of September they measured about the third of an inch in length. Since that time they have not much increased in size, the cool weather, and occasional frosts which have since prevailed having rendered them nearly torpid. These larvæ bear a strong resemblance to the female perfect insect. The body is composed of twelve segments, of which the central are the largest. The first three segments bear each a pair of feet, and the caudal segments are slightly retractile within each other, and when the insect walks, which it does very leisurely, it bends its tail beneath it, in such a way as to assist or support it on its progress. The head is very small, and is also retractile, and is usually withdrawn whenever the insect is alarmed or disturbed. These little creatures have thriven well in captivity. They are kept on a piece of moist mossy turf, which is frequently renewed, but whether they sustained themselves on the dewy herbage, or by means of the minute animal substances which it contained, it was not for a time very easy to discover. The curved and extended form of the little jaws would in the first place induce one to suppose that they were carnivorous. Olivier, however observes, in his description of the larva of the glow-worm, "Elle vie cependant sur de la terre fraîche, avec de l'herbe et des feuilles des differentes plantes : mais l'on a remarqué qu'elle devient foible et languissante, quand on la laisse manquer de terre humide. Elle est très-pacifique et paroit craintive *". Fresh earth, or the moisture which arises from it, certainly seems necessary to their welfare, for we noticed that when their turf became dry, and a slice of fresh apple or potato was introduced, they immediately settled on it, and inserted their heads as if drinking. We, however, soon after detected one with its jaws fixed in the head of a minute snail, which it appeared to be devouring, its own head being inserted into the aperture of the shell.

This observation appeared the more interesting, in as far as it served to connect these insects, by means of their habits, with that singular species the *Drilus flavescens*, which is known to feed voraciously on the *Helix nemoralis*, and the female of which was described by Mielzinski as the type of a distinct genus. This latter insect is parasitical on the body of the helix, in the shell of which it dwells and undergoes its metamorphoses.

While engaged in the observation of these insects, we met with a notice in the *Annales des Sciences* by a French gentleman of Rouen, "on the natural habits of the larvæ of the glowworm," in which we have ample proof of the carnivorous propensities of these creatures. He placed a great number of the larvæ in a vessel with fresh earth, and supplied them with various kinds of leaves. They soon, however, became extremely feeble, and remained so for several weeks, when he happened to put a dead slug in their jar, of which the young glowworms were no sooner aware, than they greedily seized upon it with their arched and sharp pointed mandibles. On the ensuing day, they were found to have eaten their way so far into the slug, that nothing but their tails was

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* *Entomologie*, t. 2. No. 28. p. 27.

visible. They were perceived, however, occasionally to quit their prey, and walk about upon the moist earth. The French naturalist was curious to observe how they would proceed with a living snail, and he therefore introduced one into his colony of insects. The animal soon began to crawl about its new domicile, but it no sooner came upon the path of a glowworm, than it was seized by the latter immediately beneath the mouth, and with such force and tenacity, that it drew itself suddenly into its shell, and of course dragged its enemy along with it. The glowworm, however, immediately disengaged its hold, and struggled back to the mouth of the shell, on the back of which it soon mounted, thus keeping the snail in a state of siege. Whenever it protruded even the point of its horns, it was instantly seized, bitten, and obliged to withdraw within its fortress. The larva being soon joined by a companion, the two attacked the unfortunate snail, and after a continued combat of several hours, they put it to death, and by next morning it was not only slain but eaten. These and similar experiments were made from the month of November to the month of June, after which the larvæ were observed to undergo their transformations. They occupied about a week in assuming the state of nymph—they continued in that state eight days longer—and then appeared in the form of the perfect insect. The nymph is larger than the larva, though not quite so long. Its colour is at first pale yellow, with two reddish spots on the posterior and lateral portion of each segment of the abdomen, as well as on the posterior angles of the thorax. It wants the large acute mandibles of the larva; its antennæ are very obvious, and consist of eleven articulations. The tarsi are likewise distinctly composed each of five articulations. The last rings of the abdomen are very brilliant, especially when the insect is handled, and it was noted as remarkable, that the whole body partook, though with less intensity, of that phosphoric splendour, which in the perfect insect characterises only the terminal segments of the abdomen. Before the termination of the eight days which are passed in the nympha state, all the more delicate colours had disappeared, and were finally converted into those duller hues which distinguish the insect in the perfect state. In this intermediate condition of nymph, its general form has undergone no great change, but the head, feet, and antennæ are considerably altered, and seem enlarged or swollen. At first the body manifests a slow and heavy movement, which, ere long, ceases, and the antennæ and feet are then applied more closely to the sides of the body. The only signs of life now consist in a movement of the abdomen, which is bent into an arch, or occasionally moved from side to side. Olivier had previously informed us, that the nymph, after quitting the skin of the larva, shone with a very lively and brilliant light of a beautiful green colour, which became more splendid for a time when the vessel which contained it was moved, and disappeared again, as if by some voluntary action of the animal, even in the nympha state, in which the vital and instinctive powers are usually almost in a state of suspension. According to De Geer, the

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larva is also luminous, although we have not yet observed any manifestation of that faculty in those now in our keeping. It has been a frequent subject of inquiry to ascertain the purposes which the light is intended to serve. In the perfect state the female continues wingless, while the male has become a swift flying insect, and this has led to the supposition, that the lambent flame, which is always most conspicuous in the female, is intended as a "nuptial lamp" to guide the male to her society. In this case, however, we do not so clearly see the use of it in the larva and nympha states, unless to be sure as a preparatory process for the formation of the animal phosphorus. Although many insects discover each other merely by the sense of smell, the fact seems nearly certain, that the male or winged glowworm ascertains his mate by aid of her luminous property, for it is a well known and successful entomological device, to place a female in a conspicuous position, and watch by her side with a view to entrap the rarer or less visible males, which ere long make their appearance. Olivier has frequently caught the males by holding a female in the palm of his hand, which makes it the more singular, that he did not perceive the two luminous points which the former bears on the last segment of the abdomen. "Je n'ai pu encore m'assurer, il est vrai, si le mâle de notre espèce commune a la propriété de luire." We may add, that the eggs are also beautifully luminous for some time after they are laid.

Dufour has examined the anatomical structure of the female glowworm. The alimentary canal measures about twice the length of the body. The œsophagus is so short as to be nearly imperceptible. It dilates immediately into a short crop. The chylific ventricle is separated from the crop by a valvular contraction. It is long, smooth, that is, unprovided with papillæ, but pursed and cylindrical in its two anterior thirds, and intestiform in the remainder. The small intestine is very short.[*]

The matter from which the luminous property of the glowworm results, has been the subject of frequent experiment and observation. It is obviously under the control of the insect, which, when approached, may frequently be observed to diminish or put out its light. On this curious subject, however, we shall merely refer to the writings of Beckerheim (*Ann. de Chimie*, t. iv. p. 19), Caradori, and Treviranus, among foreign authors, and to those of Mr Macartney (*Phil. Trans.* 1810), and Kirby and Spence (vol. ii. p. 423) among ourselves.

In the perfect female the luminous matter occupies chiefly the inferior part of the three last annuli of the abdomen. These differ from the rest in colour, and are usually of a yellow hue. The light diffused is more or less intense, according to circumstances. The insect lives a considerable time in a vacuum, and in various gases. But in nitrous acid, muriatic and sulphurous gases, it soon expires. When placed in hydrogen gas, it has sometimes been observed to produce detonation. When the

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[*] *Ann. des Sciences Nat.* t. iii. p. 225.

luminous portion of the body of a glowworm is cut off, the insect continues to live, and the separated segments retain their phosphoric nature, and are luminous for some time, whether placed in vacuum, exposed to the air, or submitted to the action of different gases. By what means the living insect is able to shroud itself in darkness, and then suddenly to clothe itself as it were in a mantle of radiant light, is a subject beyond our power of investigation; but when dead the phosphorescence seems to depend on a certain degree of softness or humidity, for when apparently quite extinct, it may be reproduced by pressure and the application of a little moisture. In the living state, however, although immersion in warm water produces a brilliant light, the application of cold water tends to its speedy extinction.

The next peculiarity in the history of the glowworm consists in the change of its habits in regard to food, which takes place on its attaining maturity. From an insect of a predaceous nature, greedy of animal juices, it becomes entirely herbivorous, not much addicted indeed to food of any kind, but still confining itself, when it does indulge in eating, to the tender leaves of plants. It is this circumstance which has no doubt led to so much contrariety of opinion, on the part of entomological writers, regarding its natural disposition. Most observers having attended to it chiefly after it had undergone its transformations, they naturally, and so far correctly, concluded that it was a herbivorous insect. Had they watched its progress from the egg, they would have come to another conclusion, at least in regard to its earlier condition. This alteration in the habits of these creatures is in fact by no means unexampled, either among other genera of the same class, or among the more distantly related reptile tribes. The most familiar instance among the latter is the common frog, which in the early state of tadpole is herbivorous, while under the perfect form it preys on flies and other insects. In this case, to be sure, the order of change is inverted, the alteration being from a herbivorous to a carnivorous diet, while the contrary takes place in the glowworm. But the analogy is more strictly maintained in the case of those aquatic beetles which form the family of *Helophoridæ*, which in the larva state are carnivorous, but become herbivorous after assuming their final transformation. The same singularity is also illustrated by many dipterous flies, which, born and bred amid the putrid moisture of animal remains, no sooner become winged insects, than they seek a purer diet in the nectarous juices of fruits and flowers.

In relation to the glowworm, the observation is of more practical interest, because the appearance of the insect among our lawns and shrubberies is so extremely ornamental during summer nights, that many have tried to import it to districts where it does not naturally occur. They have failed in consequence of endeavouring to rear the young on vegetable food. Moist herbage, or a supply of damp earth, seems almost indispensable, but in addition to these, their box must contain some minute testacea, such as the young of the ordinary species of the genus helix.

Perhaps the best plan is to hatch the eggs, and then place the young at liberty under an old hedge, as soon as they have begun to eat freely.

FAMILY—TELEPHORIDÆ.

The insects of this family consist chiefly of the species placed by Linnæus under the genus *Cantharis*. Schœffer and De Geer reserve that name to the species used in medicine, and apply the term *Telephorus* (probably from θελος φορεω, *I carry death*) to the remainder. The true *Cantharidæ*, therefore, are constituted by the genus *Meloe*, and the well-known *C. vesicatoria*, &c. The bodies of the *Telephoridæ* are long, narrow, depressed, and of a soft or somewhat flexible consistence. They abound in meadows during the summer season, on umbelliferous and other plants. The larvæ are characterised by a flat scaly head, furnished with two strong teeth, a pair of small antennæ, and four palpi. Their bodies are flattish beneath, divided into twelve rings, resembling those of caterpillars, and covered by a membranous skin, which is soft to the touch. The general colour of these larvæ is a deep velvety black, except the front of the head, which is shining. The antennæ, palpi, and feet, are of a reddish or yellowish-brown. They dwell in moist earth. Olivier was of opinion that they fed on roots; but the laborious and accurate De Geer asserts that they voraciously devour a great variety of insect prey. That of *Telephorus fuscus* was observed to change into the nympha state towards the end of May. It buried itself in the earth, but presented no appearance of cocoon. The nymph was about six lines in length, with the body somewhat arched, and of a pale reddish-white. The perfect insect was developed in the month of June. Even in the last-named state, in which so many species are chiefly occupied in the indulgence of other propensities, the *Telephori*, according to De Geer, continue their accustomed appetite. He has observed a female drag a male to the ground, turn him on his back, and suck out his entrails,—so that, as among the spider tribes, considerable caution is necessary on the part of an inexperienced suitor while making his advances. Mr Curtis has frequently seen *Telephori* with other insects in their mouths. He once observed *Tel. lividus* eating an ichneumon; and he took another of the same species with an *Empis* in its mouth. *T. fuscus* is known to prey upon its own species. Whatever we know of the anatomy of these creatures accords with their apparent dispositions. Dufour has ascertained that their digestive canal is absolutely straight. Their biliary vessels are four in number; in which character, as well as in that of their generative system, they present a resemblance to the genus *Lycus*. There are above thirty different kinds of this genus in Britain, Genus—TÉLEPHORUS, *Schæffer.*—Antennæ setaceous, rather remote from each other at the base, 11-jointed, basal joint rather robust, the rest conic-elongate, diminishing slightly in diameter to the terminal joint, which is fusiform: maxillary palpi 4-jointed, labial 2-jointed, the terminal joint of both securiform; mandibles long, slender, acute, transverse: body oblong, soft, rather depressed: head vertical, nearly rounded: thorax suborbicular or elongate-quadrate: elytra the length of the abdomen: legs rather long, the tibiæ with two remote spines at the apex, the tarsi 5-jointed, the basal joint longest, penultimate bilobed, terminal slender, clavate.—*Lat.* i. 260. *Curtis, B. E.* v. 215.

One of the most remarkable incidents in the history of this genus, is the frequency with which, in some continental countries, the species are carried into the air in great quantities by violent winds, and suddenly deposited in distant regions—thus giving rise to the belief of *insect showers.* Sweden and Hungary have been most productive of such phenomena. The little that we know of the habits of the larvæ, has been stated in the preceding notice of the family of *Telephoridæ.* The species which stands first in our list, is in fact the only one which has been particularly attended to in that condition.

T. fúscus.—Black, the thorax and sides of the abdomen rufous, the former with an angular black spot near the anterior margin: legs dusky black. 6½–7½.—*Teleph. fuscus, De Geer,* iv. pl. 2. fig. 5–15. *Canth. fuscus, Linn. Marsh.*

Head black, rather flat, and reddish beneath the eyes; antennæ black, ferruginous at the base, the second joint shorter than the third: thorax transverse, rounded on the sides and front, the margins depressed and dilated, the disk convex, finely punctured, and having a channel down the middle; the colour red, with a black spot, variable in size, towards the front: elytra linear-elongate, rather flat, soft and flexible, rugosely punctured, black, and covered with shining ash-coloured or yellowish hairs: under side black, pubescent, the apex and sides of the abdomen testaceous red: legs black, the anterior thighs sometimes reddish at the base.

Found occasionally in the King's Park, and other places near Edinburgh, but not so frequently as several of the following species.

T. rústicus.—Black, thorax and sides of the abdomen rufous, the former with an angular black spot in the middle; the thighs rufous, black at the tips. 5–5½.—*Teleph. rusticus, Oliv.* vi. pl. 1. f. 6, *a–c.* *Canth. rustica, Gyllen.*

Thorax with an angular black spot in the centre; all the thighs rufous, with the apex dusky black: in other respects scarcely differing from the preceding species.

Rather plentiful throughout the greater part of the south of Scotland. King's Park; fields and woods around Edinburgh.

T. díspar.—Black, thorax, margin of the abdomen, and legs, rufous, the hinder pair with the apex of the thighs, the tibiæ and tarsi black. 5½–6.—*Canth. dispar, Fab. Gyllen.*

Narrower than either of the preceding, the colour considerably clearer; head yellowish-red, the crown with a black spot; antennæ dusky, generally with the two lowest joints and the base of the third testaceous: thorax red, glossy and unspotted, the disk a little elevated behind, and obsoletely grooved, the margins dilated and tinged with yellow: elytra dusky black, rugosely punctured, and clothed with shining pubescence; abdomen black, with silvery white pubescence; abdomen black, the sides and apex red: anterior legs red; the middle pair with the tip of the thigh and a part of the tibiæ black: hinder thighs red, black at the tip, tibiæ and tarsi black.

Frequent in fields and woods.

T. pellúcidus.—Black, the thorax, abdomen and legs rufous, the hinder tibiæ black. 5–6.—*Canth. pellucida, Fab. Gyllen.*

Resembles the preceding very closely, differing chiefly in having the head black behind the eyes, the mouth alone being rufous; the abdomen is entirely rufous, and the legs of a similar colour, except the hinder tibiæ, which are dusky black; the intermediate tibiæ in some individuals are likewise blackish.

Of occasional occurrence throughout the Edinburgh district, and other parts of the country.

T. lívidus.—Testaceous red, a small spot on the forehead, the breast, base of the abdomen, hinder knees and tibiæ black. 5½–6.—*Oliv.* ii. 7. pl. 2. f. 8. *Canth. livida, Linn. Marsh.*

About the size of the preceding, to which it is likewise similar in most other respects, except in the colour of the elytra: head with a small linear black spot on the crown; antennæ dusky at the tip: thorax rufous, the sides paler: elytra entirely pale testaceous; under side and legs of a similar hue, the breast and base of the abdomen blackish; legs rufous, the apex of the hinder thighs and the hinder tibiæ black.

Not very common in Scotland, but very abundant in England. Cramond. Rosslyn, &c.

T. cyáneus.—Head before the eyes, thorax, and abdomen, rufous, elytra deep blue, legs black. 5½–7.—*Curtis*, v. pl. 215. *T. tricolor, Steph. Catal.*

Head black, shining, rufous before the eyes, palpi and mandibles piceous; antennæ black, the basal joints rufous, tipped above with black: thorax rounded-quadrate, very glossy, rufous, dusky in front, with a longitudinal channel, which is obsolete anteriorly: elytra dark blue, somewhat rugose, with three very indistinct lines on each: breast black, with silvery pubescence; abdomen ochreous; legs black, with the claws rufous.

This species seems confined to Scotland and the northern parts of England. It is pretty extensively, though sparingly, spread over the southern and central counties of Scotland. It was taken on the banks of the Water of Leith, near Currie, by H. C. Watson, Esq.; likewise at Kinordy in Forfar-shire by the Misses Lyell; and by Mr Syme jun. in the neighbourhood of Dollar, Clackmannan-shire. It also occurs in Dumfries and Roxburgh shires.

T. nígricans.—Dusky black, mouth, antennæ, margins of the thorax and of the abdomen, together with the legs, pale yellow, the apex of the hinder thighs and the tibiæ blackish. 4.—*Canth. nigricans, Fab. Gyllen.*

Head black, the anterior part, together with the palpi and antennæ, pale testaceous, the latter a little dusky towards the apex: thorax quadrate-orbicular, whitish-yellow, the disk elevated and covered with a large somewhat obcordate black spot: elytra black, clothed with a dense ash-grey pubescence: breast black, with silvery pubescence; abdomen black, the sides and margins of the segments pale; legs pale testaceous, the apex of the thighs and the tibiæ in the hinder pair, dusky black.

On plants and in bushy places, pretty frequent. King's Park, and fields near Edinburgh. Rosslyn, &c.

T. pállidus.—Elongate-linear, black, the base of the antennæ, elytra and legs pale. 3–3½.—*Canth. pallida, Fab. Marsh.*

Long, narrow, and slightly pubescent: head long, black, slightly attenuated posteriorly: palpi dusky; antennæ black, with the base pale: thorax narrower than the head, longer than broad, rounded in front, and margined all round, of a shining black colour, with obsolete punctures: elytra rather broader than the thorax, rugose, pale yellowish: under side of the body black, pubescent; legs pale, the upper side of the thighs occasionally blackish.

On umbelliferous plants and on trees, not very common. Braid and Collington woods, in May and June.

T. testáceus.—Short, shining black, thorax with the sides testaceous, the base of the antennæ, elytra and tibiæ, pale. 2–2½.—*Canth. testacea, Linn. Marsh.*

Much shorter, and proportionally wider than the preceding: head black, punctulated, the mandibles and base of the antennæ testaceous; thorax nearly quadrate, with the angles rounded, the disk convex, channelled in the centre, black, the sides margined, and broadly testaceous: elytra rugose, pale yellowish, pubescent: under side of the body black: thighs black, with the apex pale, tibiæ flavescent, tarsi dusky.

On umbelliferous plants, and among grass in woods, not scarce.

T. flavilábris.—Black, the mouth, base of the antennæ, edges of the thorax, and tibiæ, pale testaceous red. 3–3¼.—*Canth. flavilabris, Gyllen.*

Black, pubescent: head punctulated, ochreous beneath the insertion of the antennæ, the base of the latter of a similar colour; the palpi dusky: thorax transverse, the anterior angles rounded, the margin slightly reflexed, and more or less testaceous, particularly in the female, the disk convex, shining black: elytra rugose, with short yellowish-brown pubescence: under side of the body black, the sides and apex of the abdomen pale testaceous: thighs black, with the apex yellow, tibiæ yellow, tarsi fuscescent.

On plants in fields and meadows, occasional. Banks of Duddingston Loch. Near Craigcrook, &c.

T. melanúrus.—Rufous-yellow, thorax elongate, narrowed in front, the antennæ, tarsi, and apex of the elytra, black. 3¼–4 : 1¼.—*Oliv.* ii. 14. pl. 2, f. 9. *a*, *b*.—*Canth. melanura, Fab. Marsh.*

Rather narrow, elongate: head rufous, longitudinally grooved between the antennæ, the basal joint of the latter rufous, palpi and eyes black: thorax rufous, elongate, rather narrowed anteriorly, margined, convex behind, with a wide dorsal channel: elytra yellowish, rugose, the apex rounded and black: under side of the body and legs reddish-yellow, the tarsi black.

Very plentiful on umbelliferous plants. It is later in appearing than most of the other species, being seldom seen before the beginning of July; and it continues to prevail when most of the others have disappeared.

T. bícolor.—Testaceous-red, the eyes, wings, breast, and posterior knees black. 2¾–3.—*Canth. bicolor, Fab.*

Head yellowish-rufous, the eyes black; palpi and antennæ testaceous, the latter fuscescent towards the apex: thorax the colour of the head, suborbicular, obsoletely channelled, smooth, shining: elytra pale yellow, rugose, pubescent: breast black, with pale pubescence; abdomen rufo-testaceous, the basal segments dusky: legs rufo-testaceous, the two hinder pairs with the apex of the thighs black.

Pretty frequent. King's Park. Duddingston. Dalkeith.

The following *Telephori* have likewise been observed in Scotland: *T. pulicarius*, *T. obscurus.*

GENUS—MALTHÍNUS, *Lat.*—Antennæ considerably remote from each other at the base, nearly the length of the body, the radical joint rather robust and clavate, the 2d and 3d shortest, the remainder long and cylindric: palpi with the terminal joint ovate: head somewhat attenuated behind: thorax quadrate, short: elytra soft and flexible, shorter than the abdomen, and scarcely covering the extremity of the wings: legs long; tarsi 5-jointed, the penultimate joint bifid.—*Lat. Gen.* i. 261.

The species of this genus are of much smaller size than the generality of the *Telephori*, but their appearance and habits are very similar. The predominating colour is dusky black, variegated with markings of yellow. Many of the kinds at present regarded as distinct, resemble each other so closely as to induce the belief that they are mere varieties. They are scarcely so voracious as their allies of the preceding and following genus, and are usually observed to frequent trees, particularly oaks, feeding chiefly on the Aphides and minute Diptera which abound among the foliage.

M. bigúttulus.—Dull black, punctured, the mouth yellowish, thorax not margined on the sides, the apex of the elytra acuminated, and tipped with sulphur-yellow. 2.—*Canth. biguttula, Payk. Gyllen.*

Head projecting, dull black, thickly punctured, the mouth and palpi yellow, the tips of the latter blackish; antennæ dusky, the radical joints yellowish on the under side: thorax rather narrower than the head, very short, the sides deflexed, and not margined, the anterior and hinder margins elevated, and usually testaceous, the rest of the surface dull black, and thickly punctured: elytra wider than the thorax, scarcely shorter than the abdomen, dull black, punctured and having two or three inconspicuous elevated lines near the suture; the apex narrowed to a point, which is tipped with sulphur-yellow: under side dusky black, the apex of the abdomen and margins of the segments yellowish: thighs yellow, the rest of the leg dusky.

Found on oak trees not unfrequently. Duddingston Wood. Woods at Dalkeith.

M. sanguinicóllis.—Black, thorax rufous, elytra tipped with sulphur-yellow, tibiæ pale. 2.—*Canth. sanguinolenta, Gyllen. Cantharis minima, var. Linn.*

Nearly the size of the preceding: head smooth and shining, not narrowed behind, the mouth yellowish: antennæ dusky black, yellowish at the base: thorax the width of the head, entirely rufous, smooth and shining, the sides scarcely margined: elytra considerably shorter than the abdomen, roughly punctured, of a dusky black colour, the tips greenish-yellow: under side fuscous: apex of the abdomen and margins of the segments bright yellow: thighs dusky black, the rest of the leg yellow.

Not so common as the preceding. Duddingston, on oak trees. Dal*meny.*

FAMILY—MELYRÍDÆ.

GENUS—MALÁCHIUS, *Fabricius.* So named from the Greek word *μαλακια*, on account of the flexibility of the elytra, and softness of the whole body.—Antennæ subsetaceous, 11-jointed, the joints conic or cylindric-conic, sometimes much produced on the inner side, the 2d and 3d joints shortest: palpi filiform, maxillary 4-jointed, labial 2-jointed, the terminal joint somewhat conic, and furnished with a small vesicle at the apex: mandibles acute, the apex bifid: head transverse, retractile: thorax wider than the head, with a dilatable vesicle beneath each of the anterior angles: legs long; tarsi 5-jointed, the penultimate joint not divided.—*Lat.* i. 265. *Curtis,* iv. 167.

This genus was separated by Fabricius from *Telephorus* of Linn. The general habits of these insects resemble those of the *Telephori.* They occur on flowers, but attack other insects. One of their most remarkable characteristics consists in the power of protruding, when alarmed, from beneath each anterior angle of the thorax, and from each side of the abdomen, a red, soft, retractile vesicle, in the form of a cockade, of which the uses are entirely unknown. One of the sexes in *Malachius* is also furnished with a hook-shaped appendage at the extremity of each elytron, which is said to be seized from behind by an individual of the opposite sex, in order to arrest the flight of the former when it moves too rapidly, or seeks to escape. Most of the insects of this genus are adorned by ornamental and contrasted colours. The habits of the larvæ are as yet obscurely known. Olivier presumes that many of them live in wood, because he has very frequently found the perfect insect in timber-yards, as if newly escaped from the nymph. This is an extensive genus, and may be regarded as characteristic of temperate climates. Dejean's *Catalogue des Coleopteres* (p. 38.), enumerates forty-nine species, of which three are extra European. About twenty species occur in the environs of Paris. Mr Stephens's Catalogue contains fifteen species as British, of which several are very rare; but our own quarter of the island has hitherto produced only a single species.

M. aéneus.—Green-brassy, pilose, the mouth pale, elytra deep red externally. 4–4½.—*Fab. Canth. aenea, Linn. Don.* iii. pl. 96. f. 2.

Head wide, with a transverse impression, green-brassy, the mouth pale; antennæ black: thorax transverse, rounded, shining green-brassy, with strong hairs, the anterior angles with an oblique spot of deep red: elytra nearly smooth, pilose, with a large triangular space of green-brassy, which has its basal angles on the shoulders, and its apex beyond the middle of the suture, the rest deep red: under side shining green-brassy, the sides of the abdomen, and sometimes the edges of the segments, red: legs dull green, pubescent.

Frequents nettles, and other plants. Rare in this district, and seemingly not more frequent in other parts of Scotland.

The other members of this restricted family known to us as inhabitants of Scotland, are *Elicopis impressus* and *Dasytes æratus,* both of which have been found in Dumfries-shire.

FAMILY—TILLIDÆ.

Many of the insects of this family are extremely beautiful. They reside either in rotten wood, or in the nearly dried remains of animals. Most of the larvæ are carnivorous *.

GENUS—NECRÓBIA, *Latreille.* From *νεκρος a carcass*, and *βιος life*, living on dead bodies.—Antennæ the length of the thorax, the basal joint robust, the six following more slender, the 3d from the base rather longest, 8th, 9th, and 10th cup-shaped, increasing in width, terminal very large, quadrate, with the angles rounded, and the apex somewhat oblique (Pl. I. fig. 25.): palpi with the terminal joint longest, fusiform-truncate: mandibles with a single tooth beneath the apex: thorax rounded quadrate: elytra oval, truncated at the base: tibiæ slender, without spines; tarsi 4-jointed, the joints dilated and membranous at the apex; the unguicular one long and slender.—*Lat. Gen.* i. 274. *Curtis, B. E.* viii. 350.

We owe to Geoffroy the separation from the genus Dermestes of a group of insects, from which he formed the genus Clerus. From the latter genus M. Latreille, at a later period, withdrew the subjects of our present notice, and bestowed upon them the name which they now bear. These insects are rather richly adorned for such foul feeders, and deep blue is the prevailing colour. They sometimes occur on flowers, and their flight is slow. The body of the larva is soft, lengthened, and annulated. It has six scaly feet, and two crotchets towards the anal extremity. It is of rapid growth, and appears to undergo its metamorphoses in whatever decaying *nidus* it may have previously obtained its food. This is a limited genus, of which probably not more than three species occur in Britain. Of these we have to record the two following as Scottish.

N. ruficóllis.—Greenish blue, with the thorax, base of the elytra, and legs, rufous. 2¼-2½ : 1.—*Oliv. Clerus ruficollis, Marsh.*

Oblong-ovate, covered with long hairs, shining; eyes and antennæ black: head bluish-green, punctured: thorax somewhat quadrate, with the sides rounded, rufous, punctate: elytra rufous at the base, the rest greenish blue, with eight punctured striæ on each, the interstices finely shagreened: thorax beneath and breast rufous, abdomen black: legs rufous.

Rare; on the bulwark behind the Glass-Works at Leith. Numerous examples have occurred near Raehills, and at Moffat in Dumfries-shire.

If the geographical notices which we possess of this species are correct, its distribution must be very extensive. According to Olivier, it occurs both in Africa and the East Indies. "Insectum mihi carissimum," says Latreille; "illis enim infelicissimis temporibus quibus calamitatum omnium pondere obruta Gallia trepidanter gemebat, amicissime auxiliantibus Bory de Saint Vincent, Dargelas, Burdigalensibus, posteriori maxime, hoc animalculum mihi libertatis salutisque occasio miranda evasit."

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* *Stephens' Illus.* iii. 321.

N. violacea.—Bright blue, shining, pubescent; antennæ and legs black. 2¼.—*Oliv. Cler. Quadra. Marsh.*

Shining, punctate, pubescent: head and thorax greenish blue, the latter with a narrow shining impunctate space down the centre: elytra bright cyaneous, punctate-striate, the punctures deeply impressed at the base: under side of the body, legs, and antennæ, black.

On dead animals, dried bones, &c., rather rare. Sea shore. Salisbury Craigs.

FAMILY—PTINIDÆ.

THE Ptinidæ, as Mr Stephens has observed, consist of two apparently distinct groups, one of which has the antennæ filiform, with the tarsi simple and always pentamerous; the other having the three apical joints of the antennæ considerably and suddenly elongated, and slightly increased, with the tarsi occasionally tretramerous, and the penultimate joint sometimes bilobed. Such of the larvæ as live on dry wood, are white and soft, with a brown scaly head, armed with two stout mandibles, with which they gnaw old timber into a fine yellowish powder; such as feed on animal remains resemble the larvæ of lamellicorn beetles, being cylindrical and curved posteriorly, so that they cannot walk upon a flat surface[*].

GENUS—PTILÍNUS, *Fab.*—Antennæ shorter than the body, remote from each other at the base, inserted before the eyes, the radical joint long and clavate, 2d small, subglobose, the remainder pectinated or serrated: palpi short, the terminal joint conical acute: mandibles bifid at the apex: body subcylindric: thorax subglobose; tarsi 5-jointed.—*Lat. Gen.* i. 277.

This genus was established by Geoffroy. The antennæ are pectinated or feathered, for which reason the name Ptilinus (derived from *πτίλον, a feather*,) has no doubt been bestowed upon it. The species inhabit old wood, in which they perforate deep round holes. In these they also undergo their metamorphoses, and only appear externally in the perfect state.

P. pectinicórnis.—Brownish black, antennæ and legs pale testaceous, the elytra of a similar hue, or fuscescent, the anterior margin of the thorax not emarginate. 1¾–2.—*Ptinus pectinicornis, Linn. Don.* x. pl. 326. ♀ *Pt. serraticornis, Marsh.*

Elongate, nearly cylindrical, dull brownish-black, subpubescent: head punctulated, the mouth slightly testaceous; antennæ pale testaceous, pectinated in the males, and deeply serrated in the female: thorax nearly globose, thickly and coarsely punctured, the anterior margin reflexed, and entire: elytra very convex, the shoulders rather gibbous, the apex rounded, pale testaceous, or brownish-black, thickly punctured, somewhat longitudinally towards the sides: under side more glossy than the upper surface, pitch-black, punctulated: legs pale testaceous.

Inhabits old wood, especially decaying willow trees, but is not so frequent in this district as in many parts of the country.

[*] *Ibid.* 229.

GENUS—PTÍNUS, *Linn.*—Antennæ as long as the body, inserted between the eyes near each other, the joints cylindric, nearly of equal length, except the 2d, which is short: palpi nearly filiform: mandibles bidentate: maxilla with a single tooth towards the middle: thorax narrower than the elytra, hood-shaped, generally contracted behind: elytra nearly oval or subglobose: legs slender, the thighs slightly thickened; the tarsi 5-jointed.

The minute species of which this genus is composed, occur in granaries and inhabited houses. The antennæ of the males exceed in length those of the females, and in certain species the latter are apterous. The larvæ are extremely destructive in museums, as they feed on the contents of herbaria, and on the dried skins of birds and quadrupeds.

P. sexpunctátus.—Fuscous, with the forehead, scutellum, an abbreviated fascia near the base of the elytra, and two spots behind the middle, white. 2–2¼.—*P. sexpunctatus*, *Panz.* *Gyllen.*

Oblong and pubescent, of a fuscous or brownish colour, the forehead densely clothed with white pile, antennæ very dull ferruginous: thorax convex in front, having four tubercular elevations placed transversely, and covered with tufts of hair: elytra dark brown, crenate-striate, with very short pubescence disposed in lines, having a fascia of snow-white pile near the base, not reaching quite to the suture, and two white spots, often uniting, behind the middle: under side and legs dusky ferruginous, with white pubescence.

Found in old woods, in houses, &c.; but does not occur so frequently as the following species.

P. Fur.—Dusky ferruginous, the elytra with two interrupted fasciæ of white pile. 1¼–2.—*Linn.* *Marsh.* *Don.* xii. 79, pl. 422. ♂ *P. testaceus*, *Marsh.*

Usually rather less than the preceding, but liable to great variation both in size and colour: the latter generally ferruginous, more or less dusky; the surface covered with short pubescence of an ash colour: antennæ ferruginous, pubescent: thorax so convex in front as to appear nearly globose, having four tufts of hair placed transversely, and a longitudinal channel down the middle: elytra ovate in the female, without a tubercle on the shoulder; nearly linear in the male and having the shoulders prominent; crenate-striate, fuscous ferruginous, with two interrupted fasciæ of white pile, one near the base not reaching to the suture, the other behind the middle composed of white spots: under side and legs ferruginous; the thighs rather long and clavate.

Not unfrequent in old wood in houses.

P. crenátus.—Dull testaceous, the elytra without spots. 1½–1¾.—*Fab.* *P. ovatus*, *Marsh.* ♂ *P. cerevisiæ*, *Marsh.*

Still less than the foregoing, of a testaceous colour, more or less obscure, and clothed with cinereous pubescence: antennæ ferruginous: thorax very convex, having a groove down the middle, the tufted tubercles scarcely perceptible: elytra wide, globose-ovate in the female, narrower and oblong-ovate in the male, punctate-striate, without white spots: under side testaceous: legs ferruginous, the thighs clavate, especially in the male.

In such places as the two preceding species, occurring occasionally about Edinburgh and in other parts of Scotland.

P. imperiális, the finest species of the genus, has been found on birch trees near Jedburgh, but it appears to be rare in all parts of the country. P. Lichénum. Raehills, *Rev. Wm. Little.*

GENUS—ANÓBIUM, *Fab.*—Antennæ remote from each other at the base, inserted before the eyes, the three last joints abruptly thickened and lengthened, the 9th and 10th somewhat obconic, the terminal ovate: palpi clavate: mandibles bidentate at the tip: body ovate, subcylindric, rounded before and behind; thorax sometimes short and transverse, at other times scarcely wider than long, hood-shaped, the hinder part of the back gibbous or carinated: tarsi consisting of five short articulations.—*Lat. Gen.* i. 275.

The name of Byrrhus, originally bestowed upon the insects of this genus by Geoffroy, was transferred by Linnæus to a very different group. His genus Ptinus included both Ptilinus and Anobium. Fabricius was the author of the genus Anobium, so called from *αναβιον*, *resuscitated.* The species are characterised in common with some of their congeners, by their frequent simulation of death, and their re-assumption of activity as soon as the threatened danger is removed. In this instinctive mode of preservation Olivier accuses them of exhibiting an invincible obstinacy. "Ils se laissent entièrement bruler sans donner aucun signe de vie." The larvæ of these insects are extremely injurious to old furniture, in which they perforate numerous round holes. Hence the genus is named Vrillette by the French, from *vrille*, a gimlet. In the larva state they resemble small, white, soft worms, with six short minute feet. The head is scaly, and is terminated by two maxillæ, in the form of strong cutting pincers, with which they gnaw the wood into the finest saw-dust. When about to change into the nympha state, they line the bottom of their little cells with a few silken threads. Other species feed on flour, bread, sealing-wafers, &c. where they form grooves or galleries, according to the thickness of their working materials. The superstitious fancy of the *death-watch* has arisen partly from an insect of this genus, the *An. tesselatum.* It is supposed, however, to share this mysterious calling with the *Termes pulsatorium* of Linn., and probably with several others. According to Dr Shaw, it is in the advanced state of spring that the former of these insects commences its mysterious pulsation, which he asserts is nothing more than the signal call of the sexes. The number of distinct strokes is generally from seven to eleven, and these are occasioned merely by its beating with its head, with considerable force and quickness, against the plane of its position. Where the insects are numerous, as is not unfrequently the case in old houses, these sounds may be heard during the whole day, especially in warm weather. The sound greatly resembles a moderate tapping on a table with the finger nail, and indeed by that simple process they may be induced to beat in reply when not otherwise inclined so to do. "He that could eradicate this error," says the quaint Sir Thomas Brown, in allusion to the death-tick, "from the minds of the people, would save from many a cold sweat the meticulous heads of nurses and grandmothers." *

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* *Pseudodoxia Epidemica.*

A. *Elytra punctate-striate.*

A. **castáneum.**—Fuscous, the thorax transversely impressed in front, elytra somewhat castaneous, deeply crenate-striate. 2½.—*Fab. Oliv.* ii. 7. pl. i. f. 2. *a, b. P. castaneus, Marsh.*

Dull brown, with very short yellowish-brown pubescence: head nutant, punctulated, the eyes prominent and globose; antennæ rufo-ferruginous: thorax short, somewhat rounded behind, transversely depressed in front, the middle rather convex, punctulated and pubescent like the head: elytra obscure castaneous, elongate, linear, the shoulders prominent, the apex rounded; closely punctate-striate, having a short stria on each side of the scutellum, the punctures somewhat quadrate and rather deeply impressed, the interstices punctulated and sparingly pubescent: under side of the body fuscous, somewhat shining; legs ferruginous-brown.

Rather a scarce species in Scotland: it inhabits the alder trees at the west end of Duddingston Loch, the perfect insect appearing in May. Cramond.

A. **striátum.**—Brown, somewhat pitchy, the thorax obsoletely grooved and produced towards the base into an elevated triangular ridge. 1½–2. *Oliv.* ii. 9. pl. 2. f. 7. *a, b. An. pertinax, Fab.*

Dull brown, or somewhat castaneous, with short greyish pubescence: head partially concealed by the thorax, finely punctulated; the eyes black, globose; antennæ rufo-ferruginous: thorax hood-shaped, gibbous, produced into a triangular elevation behind, with an obsolete channel in the centre, and two foveæ on each side within the margin, the anterior part castaneous, the rest more obscure: elytra linear-elongate, convex, the apex obtusely rounded, closely punctate-striate: under side of the body and legs dull ferruginous, with fine pubescence.

Very common in old timber.

This species was observed by Latreille to produce the sound called the *death-tick*, by striking its mandibles upon wood. It was immediately answered from within by a precisely similar sound.

This little timber-borer, which is the *A. pertinax* of Fabricius, has been long famous for a most *pertinaceous* simulation of death. "All that has been related of the heroic constancy of American savages, when taken and tortured by their enemies, scarcely comes up to that which these little creatures exhibit. You may maim them, pull them limb from limb, roast them alive over a slow fire,* but you will not gain your end; not a joint will they move, nor show by the least symptom that they suffer pain. Do not think, however, that I ever tried these experiments upon them myself, or that I recommend you to do the same." †

B. *Elytra irregularly punctured.*

A. **mólle.**—Oblong, testaceous, the thorax rounded behind. 2.—*Fab. Oliv.* ii. pl. 2. f. 8. *a, b. Ptinus mollis, Linn.*

Of a uniform testaceous colour, punctulated and clothed with greyish pubescence; the antennæ ferruginous: thorax short, rounded behind and on the sides, the latter rather broadly margined, moderately convex above, the surface equal: elytra elongate linear, convex, thickly and irregularly punctulated: under side of the body and legs ferruginous, the former punctured.

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* *De Geer,* iv. 229.

† *Introd. to Ent.* vol. ii. p. 235.

Frequents fir-woods, and is not unfrequent in Scotland: it is a rare species in the south.

A. Abíetis. — Oblong-ovate, fusco-testaceous, pubescent, the thorax truncate behind, the sides depressed. 2.—*Fab.*

Closely allied to the last, but distinguished by its smaller size, greater convexity, and shorter body: head and eyes as in the preceding; antennæ ferruginous: thorax broad, transverse, obliquely truncate in front, and nearly in a straight line behind, the sides deflexed, rounded, dilated, and thickly pubescent, the disk convex, punctulated, and obscurely ferruginous: elytra linear-elongate, very convex, thickly punctulated, pubescent, of a testaceous-brown colour, the apex, which is rounded, pale rufescent: under side of the body rufo-ferruginous, somewhat shining, the legs of a paler hue.

This rare species was taken many years ago in fir-woods near Edinburgh by Mr Wilson, who furnished Dr Leach with specimens.

A. erýthropum.—Pitch-black, somewhat shining and pubescent, antennæ, legs, and eyes ferruginous. 2.—*Leach. Steph.*

This insect is stated in Mr Stephens's Illustrations, from which the above characters are extracted, to have been taken in "Ravelstone Wood, by R. Rawlins, Esq."

GENUS—CIS, *Latreille.* From *κις*, a worm anciently supposed to be produced from putrid wood and decaying corn; *Theoph.* l. iv. c. 16.—Antennæ nearly one-half longer than the head, clavate, 10-jointed, 1st joint large and ovate, 2d small ovate, 3d slender obconic, 4–7 very short, transverse, perfoliate, 8th and 9th large and cup-shaped, terminal ovate: palpi very unequal, maxillary longest, thickening to the apex, the terminal joint subovate; maxillary with the terminal joint slender, conic: mandibles trigonate, the apex bifid: body ovate, convex above: head transverse, elevated behind: thorax transverse, the anterior part arched for the reception of the head: tarsi 4-jointed.—*Lat. Gen.* iii. 11. *Gyllen.* iii. 377.

C. Boléti.—Brownish-black, slightly shining, subpubescent, antennæ and legs testaceous, elytra irregularly and rather rugosely punctured. 1½–1¾.—*Anob. Boleti, Fab. Anob. bidentatum, Oliv.* ii. pl. 2. f. 5. *a, b, c. Pt. Boletorum, Marsh.*

Head nearly concealed by the projection of the thorax, flat, with an obsolete tubercle in the middle, and an elevated margin; the eyes globose and rather prominent; mouth and antennæ testaceous, the three terminal joints generally dusky: thorax transverse, the anterior margin produced in the centre, and having a sinuosity on each side, the lateral margins rounded, dilated, and slightly reflexed, the disk very convex, unequal, finely punctulated and pubescent: elytra about thrice the length of the thorax and scarcely wider, dark brown or castaneous, with pretty large punctures often arranged in irregular lines: under side of the body pitchy-brown, shining: legs testaceous.

On the *Polyporus versicolor* and other tree fungi, not unfrequent. Duddingston, very plentiful in May. Woods at Cramond, Dalkeith, and Rosslyn.

C. nítidus. — Pitchy-brown, shining, glabrous, the elytra obsoletely punctulated, antennæ and feet testaceous. ¾–1. — *Gyllen. Anob. nitidum, Fab.*

Head deflexed, slightly margined, very minutely punctulated; mouth and antennæ pale testaceous: thorax slightly bisinuated in front, the centre somewhat produced, the sides and hinder angles rounded and narrowly margined, convex above, smooth and punctulated like the head: elytra rather more than twice the length of the thorax, of the same colour, the punctures larger and more obsolete: under side of the body paler, legs testaceous.

On old roots and stumps of trees, usually under the moss or bark. Duddingston Wood, in considerable numbers on the *Polyporus vulgaris*.

C. bidentátus is the only other Scotch species known to us, although the genus contains thirteen different kinds.

FAMILY—BOSTRICIDÆ.

The insects of this family are extremely injurious, both in the larva and perfect state, to forest-trees. The former excavate innumerable tortuous paths between the bark and wood, and sometimes perforate the timber itself so as to render it useless, and even to cause the death of the tree. Latreille informs us, that the females deposit each from sixty to eighty eggs, and that 80,000 larvæ have been calculated to inhabit a single tree.

Genus—**HYLESINUS**, *Fab.* From *υλη*, *wood*, and *σινω*, *I injure.*—Antennæ clavate, the radical joint long and bent, 2d globose, the following transverse, three last forming an ovate club, which is acuminated to the apex: mandibles dentate on the inner side: body short and ovate: eyes oblong: thorax narrowed in front, sinuated behind: tibiæ compressed, dentate at the apex; penultimate joint of the tarsi bilobed.

H. crenátus.—Black, pubescent, thorax deeply punctured and granular, elytra crenate-striate and of a pitchy colour, antennæ ferruginous. 2–2¼.—*Fab.* *Ips sulcatus*, *Marsh.*

Body slightly elongate, black, pubescent: head short and strong; antennæ ferruginous: thorax rather unequal on the disk, covered with coarse punctures which give it a granular appearance: elytra brownish-black, the crenated striæ very deeply impressed, the interstices rough: under side black; legs piceous, except the tarsi which are more or less deeply ferruginous.

Beneath the bark of trees and in decaying timber, not very common.

H. Fráxini.—Black, clothed with cinereous scales variegated with fuscous on the upper surface, antennæ ferruginous, the club obscure. 1¾–2¼.—*Fab.* *Ips varius*, *Marsh.*

Blackish or brown, covered with ashy scales above and variegated with others of a fuscous colour: antennæ ferruginous, the club dusky: thorax shaped nearly as in the preceding species: elytra indistinctly punctate-striate: under side clothed with cinereous pubescence: legs pitchy, the tarsi ferruginous.

Inhabits the bark of trees, particularly the ash, and is pretty frequent on the wing during warm weather, in the vicinity of woods.

Genus—**HYLÚRGUS**, *Lat.*—Antennæ about the length of the head, clavate, 11-jointed, 1st joint very long, bent, clavate, 2d globose, 3d smaller, obconic, four following transverse, the remaining four forming a large globose-ovate pubescent club (Pl. II. Fig. 1:): palpi short and rigid, 3-jointed, the joints becoming gradually more slender to the apex: mandibles triangular, acute, with two teeth on the internal edge: body linear cylindric: eyes elongate and narrow: thorax narrowest in front: tibiæ dilated at the apex, where they are bidentate externally; tarsi 5-jointed, two basal joints short, 3d bilobed, 4th very indistinct, the unguicular one elongate.—*Lat. Gen.* ii. 274. *Curtis, B. E.* iii. 104.

H. pinipérda.—Pitch-black, clothed with short pubescence, elytra punctate-striate, the interstices roughly punctured, antennæ and tarsi ferruginous. 1½–2.—*Dermestes piniperda, Linn. Curtis*, l. c.

Shining black, punctured, and slightly pubescent; head considerably produced in front, having a short longitudinal ridge in the centre anteriorly; antennæ ferruginous: thorax thickly covered with rounded punctures: elytra cylindric, a little wider than the thorax, rugosely punctured, with nine punctured striæ on each: under side shining black: legs pitch-black, tarsi testaceous.

The whole body is sometimes of a pale testaceous colour, the eyes alone being black. In this state it is *Bostrichus testaceus* of Fabricius. It likewise frequently occurs with the elytra deep chesnut colour or reddish.

In fir-woods, rather frequent. Craiglockhart. Corstorphine Hill, &c.

Mr Lindley communicated the following observations to Mr Curtis, in illustration of the habits of this species. "For the purpose of observing its proceedings more narrowly, I placed a shoot of the Scotch fir under a glass with the insect. In about three hours after, it had just begun to pierce the bark at the base of one of the leaves; its mandibles seemed chiefly employed, its legs being merely used as a means of fixing itself more firmly. Four hours after, its head and thorax were completely buried in the shoot, and it had thrown out a quantity of wood which it had reduced to a powder, and which nearly covered the bottom of the glass. In sixteen hours more it was entirely concealed, and was beginning to form its perpendicular excavation, and was busily employed in throwing back the wood as it proceeded in destroying it; there were evidently two kinds of this sawdust, part consisting of shapeless lumps, but the greater portion of very thin, semi-transparent lamellæ, or rather shavings. I now examined it every day till the 5th, when I found it had emerged through the central buds at about an inch from where it had first commenced."[*]

H. áter.—Glossy black, nearly glabrous, tarsi and antennæ ferruginous, elytra coarsely crenate-striate, the interstices wrinkled across. 2–2¾.—*Hyles. ater, Fab. Ips Boleti, Marsh.*

Much narrower than the preceding, and more elongate, nearly cylindric, glossy black, with scarcely perceptible pubescence: head elongate, with a longitudinal ridge in the middle anteriorly; antennæ ferruginous: thorax long, nearly cylindrical, covered with large punctures: elytra deeply crenate-striate, the spaces between the striæ rough with transverse wrinkles: under side and legs black; the tarsi, and not unfrequently the apex of the tibiæ, ferruginous.

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[*] *British Entomology*, vol. iii. fol. 104.

In such places as the last, but scarcely so frequent. Craiglockhart. Rosslyn and Auchindinny woods.

H. obscúrus.—Fuscous-black, elytra deeply punctate-striate, and of a dull reddish colour, antennæ and legs ferruginous. 1¼–1½.—*Ips obscurus*, *Marsh.*

Small, rather wide, of a dull fuscous black colour, with very short thin pubescence; head not much produced anteriorly; antennæ ferruginous: thorax with an indistinct dorsal ridge, the surface pretty thickly punctured: elytra obscurely reddish, or dull pitch-red, rather deeply punctate-striate: under side fuscous-black; legs ferruginous.

Not very common. Cramond. Woods at Hawthornden.

SECTION—IV.

SUBSECTION—RHYNCHOPHORA.

FAMILY—CURCULIONIDÆ.

This numerous and widely extended family, so remarkable for the beauty of its South American species, is easily recognised by its more or less extended muzzle, terminated by a mouth, of which the parts, from their peculiar structure and position, are not easily determined without the aid of microscopical examination and dissection (Pl. II. Fig. 2. *rostrum and antennæ of one of the Curculionidæ*). The abdomen is generally of a bulky form, the antennæ usually geniculate and clavate, and the penultimate joint of the tarsi almost always bilobate. In many tribes, the posterior thighs are dentated. The body of the larvæ is oblong, resembling a small white worm, and exceedingly soft. The head is squamous, and the feet are either wanting, or mammillæform. They live by gnawing the various parts of plants. Many dwell exclusively in the interior of fruits and seeds, and do great damage to the farmer and grain-dealer.

The muzzle in this richly-adorned family differs essentially from the *rostrum* of the Hemipterous species. It is in fact merely a prolongation of the head, and not composed of the parts of the mouth, as in the last-named order. This prolongation, however, exerts an influence over the alimentary tube—the œsophagus is somewhat prolonged—and, as we find in the true suctorial tribes, there is also a provision of the salivary glands.

We have little detailed information regarding the internal structure of the *Curculionidæ*. Two species (*Attelabus betuleti* and *Cryptorhynchus lapathi*) have been examined and described by Ramdhor*. In both of these, the alimentary canal was moderately long, the stomach partially shaggy, and the small intestine inversely claviform. In other respects, however, they differed materially. There was no crop or gizzard in the former, the stomach was fringed on each side, except at its upper extremity, with a series of small cæca or shags, and there were three pair of bile-vessels;—in the latter, the gullet was dilated into a crop, which included a gizzard of singular and exquisite construction; for, though so minute as scarcely to exceed a large pin's head in size, it was found to be provided internally with more than 400 pairs of teeth, moved by an infinitely greater number of muscles. A transverse section of this gizzard represented two concentric stars, with nine rays each—the object of this structure being the comminution of the timber which the insect has to perforate, and probably devour. The stomach was very slender, but dilated in the middle into a spherical vesicle, and only two pairs of bile-vessels were observable[*].

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* *Abbildungen zur Anatomie der Insecten.*

It may well be supposed, that in a family consisting of between 2000 and 3000 species, many diversities occur both in habit and external structure. The antennæ are sometimes straight, but more frequently have an angular bend. They are inserted either towards the extremity of the muzzle, when that organ is short, or nearer the centre, or even towards the base, in the long-snouted species. The number of the articulations of the antennæ varies in certain genera from six to ten; but eleven is the more usual number, or even twelve, if we count the false or terminal article. The body is generally narrowest in front, with a large abdomen, covered by very hard elytra. The tarsi are very frequently garnished beneath with short hairs. None of the species are carnivorous in any degree.

Genus—MÉCINUS, *Germar*. From *μηκος*, *length*, the body being long and cylindrical.—Antennæ a little longer than the head and rostrum, geniculated, 10-jointed, radical joint elongate, clavate, not reaching to the eyes, 2d and 3d rather long, obconic, 4–6 short and transverse, the four last forming a compact oval club: rostrum rather short and stout, deflexed, rounded: thorax subcylindric, the extremity of the front a little narrowed: elytra elongate, subcylindric, covering the abdomen: legs short and stout; thighs thick; tibiæ compressed and armed with a hook internally; tarsi 4-jointed, penultimate one bilobed.—*Schoen. Dispos. Meth. Curcul.* 321.[†]

M. semicylíndricus.—Black, with cinereous pubescence, the base of the antennæ and the tarsi ferruginous. 1½–1¾.—*Cur. semicylindricus, Marsh. Rhynchaenus semicylindricus, Gyllen.*

Elongate, nearly linear, thinly covered with cinereous hairs, and entirely of a black colour, except the base of the antennæ and the tarsi, which are ferruginous: head rounded, minutely punctured; rostrum short and punctulated in the male, longer and smooth in the female: thorax with a faint transverse line within the apex, the disk a little convex, and thickly punctured: elytra the breadth of the thorax, punctate-striate, the interstices wrinkled: under side punctured and pubescent: thighs strong and thick, and furnished with a small tooth, which is scarcely perceptible except in the anterior pair.

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[*] *Introduction to Entomology*, vol. iv. p. 107.

[†] The generic characters throughout this extensive family are chiefly taken from "*Curculionidum Dispositio Methodica*," *auct. C. J. Schoenherr.* Lipsiæ, 1826.

Under stones in the King's Park, Leith Links, shore at Portobello, &c.: occasional.

GENUS—CALÁNDRA, *Clairv.* From *καλεῖν, to call*, and *ανηϱ, a man.*—Antennæ scarcely longer than the head and rostrum, inserted near the base of the latter, 9-jointed, the elongated radical joint reaching to the thorax, the six following short and truncated, the remainder forming an elongate, subovate, slightly acuminated club, the terminal joint of which is spongy: rostrum elongate, rounded, usually a little curved: thorax much elongated, a little narrowed in front, somewhat depressed above: elytra scarcely longer than the thorax, and shorter than the abdomen: legs rather short; tarsi with the penultimate joint slightly bilobed.

C. granária.—Pitch-red, glabrous, the thorax deeply punctured. 1⅔–2. —*Cur. granarius, Linn.*

Generally pitch-red, sometimes pale ferruginous: head and rostrum nearly smooth, the latter scarcely curved, and shorter than the thorax: thorax large, nearly the length of the elytra, somewhat depressed above, and covered with large oblong punctures: elytra rather narrower than the base of the thorax, not covering the apex of the abdomen, and marked with deep striæ, which are faintly punctured in the bottom: under side deeply punctured; legs ferruginous.

Apparently rare in Scotland, and probably in other northern countries.

GENUS—CÍONUS.—Antennæ inserted rather before the middle of the rostrum, 10-jointed, the first joint abruptly thickened at the apex, reaching nearly to the eyes, 2d and 3d rather long obconic, the three following short obconic, the rest forming an oblong-ovate pointed club: rostrum longer than the head and thorax, rather slender, rounded, arcuate: eyes large, ovate, approximating: thorax small, transverse, narrowed in front: elytra large, quadrate-ovate, longer than broad, and covering the abdomen: legs rather short; thighs clavate, dentate; tibiæ without spines; tarsi spongy beneath, 1st and 2d joints triangular, 3d dilated and bilobed, unguicular clavate.

C. Scrophuláriæ.—Brownish-black, the thorax entirely clothed with hoary pubescence, elytra with the alternate interstices variegated with white and black, the suture with two large velvet-black spots, tarsi dull rufous. 2–2¾.—*Gyllen.* *Cur. Scrophulariæ Linn.*

Head and rostrum black, punctulated, with short scattered pale hairs; eyes brown; antennæ dusky-ferruginous, the club more obscure: thorax very small, depressed in front, transversely elevated near the middle, with an obsolete tubercle on each side, the whole densely clothed with hoary scale-like hairs, beneath which the surface is black and punctulated: scutellum oblong, black, the apex hoary: elytra twice the breadth of the thorax, the shoulders rectangular, the apex rounded; of a brownish-black colour, not very regularly punctate-striate, the alternate interstices densely pubescent, and variegated with alternating marks of white and black, the suture marked in a similar manner, and having a large common oblong spot before the middle, and another towards the apex, of a deep velvet black, each spot with an adjoining patch of white: under side of the body black, the breast clothed like the thorax, the abdomen sparingly pubescent: legs pitchy-black, variegated with whitish hairs: the thighs with a strong tooth.

On the flowers of the *Scrophularia nodosa,* Water Figwort, pretty frequent: also on the flowers of *Verbascum Thapsus* at Blackford Hill.

It is sometimes found on the first mentioned plant in May, but seldom appears in considerable numbers till June and July, when the plant is in flower. Banks of Braid Burn, and of the Water of Leith. Woods on the sides of the Esk above Musselburgh, and about Dalkeith.

The larva of this species is always covered with slime, which, though it renders its appearance disgusting, enables it to walk with greater steadiness and security, by lengthening and shortening the segments of its body, over the leaves of the common figwort.

C. Blattáriæ.—Brownish, clothed with ash-coloured hairs, thorax dusky behind, elytra obscurely variegated with cinereous and brown, the suture with two large spots of the latter colour, tibiæ and tarsi testaceous. 1¾.—*Clairville. Cur. bipustulatus, Marsh.*

Much less than the preceding; entirely covered with ash-coloured hairs: antennæ testaceous: thorax with a triangular patch of brown on the upper side behind: elytra with the alternate spaces between the striæ variegated, sometimes very obscurely, with brown spots, and the suture marked with two large blackish spots, placed as in *C. Scrophulariæ:* under side and thighs blackish and pubescent, the breast densely so: tibiæ and tarsi testaceous.

Frequents the above mentioned plants, particularly the different species of Verbascum, in gardens, &c. but is scarce. Garden near Drumsheugh, on the horse-radish. Near Cramond.

GENUS—OROBÍTIS, *Germar.* From ὀροβίτης, which is derived from ὄροβος, *a small species of Vetch*, and εἶδος, *like.*—Antennæ longer than the head and nostrum, 12-jointed, the elongate radical joint not reaching to the eyes, 2d rather long obconic, 3–6 very short obconic, 7th and 8th rounded, the 4 last forming an oval acuminated club: rostrum half the length of the body, rounded, closely applied to the body: head retracted within the thorax, the crown alone being visible: thorax much wider than long, narrow in front: elytra wider at the base than the thorax, the anterior part gibbous: legs elongate, retractile; thighs curved, grooved for the reception of the tibiæ, the latter rounded, without spines; tarsi spongy beneath, the penultimate joint bilobed.

O. cyáneus.—Black, glabrous, covered with white scales beneath, elytra blue-black, antennæ and legs pitchy. 1–1½.—*Cur. cyaneus, Linn. Attelabus globosus, Fab. Rhynch. globosus, Gyllen.*

Body very convex, globose; forehead black, minutely punctured; rostrum black, punctured and somewhat striated; antennæ rather dull ferruginous: thorax nearly glabrous, black, sometimes glossed with blue or violet, obsoletely punctured, the sides and under side covered with white scales: scutellum white: elytra much wider than the thorax, attenuated behind, very convex anteriorly, of a bluish-black colour, finely marked with smooth striæ, the interstices flat: under side clothed with cinereous scales: legs pitch-black, the tarsi paler.

Rare in Scotland. A few individuals have occurred near Cramond, and in the neighbourhood of Dalkeith.

GENUS—CEUTORHÝNCHUS, *Schuppel.* Named from κεύθω, *I conceal*, and ῥύγχος, *rostrum.*—Antennæ rather short and slender, longer than the head and rostrum, 12-jointed, the radical joint (or scape) not reaching to the eyes, 2d and 3d elongate obconic, the rest short, the club ovate and acuminated, consisting of 4 or 5 joints: rostrum rounded and filiform, curved, received into a groove in the underside of the thorax; the latter small, somewhat conic, narrowed or coarctate in front, bisinuated behind, having a groove beneath, which is more or less elongate: elytra subtriangular, the apex of each rounded, rather shorter than the abdomen: thighs clavate: tibiæ truncate at the apex, and without spines; tarsi spongy beneath, the penultimate joint bilobed.

A. *Thorax without tubercles.*

a. *Thighs without a tooth on the under side.*

C. Quércus.—Brownish-black, with cinereous scales, elytra testaceous, with three waved transverse bands of cinereous scales. 1¼.—*Cur. Quercus, Herbst.*

Head minutely punctured and scaly; rostrum blackish, received into a deep groove in the breast, extending to the mid legs; antennæ ferruginous, dusky at the tip: thorax with a transverse impression anteriorly, the frontal margin a little elevated, the disk punctured, the sides and under surface thickly covered with ashy scales: elytra testaceous, sometimes rather obscure, with three narrow waved lines of whitish scales across the disk, somewhat faintly punctate-striate, and having a very obsolete tubercle near the apex: under side black, punctured and scaly: legs ferruginous, sometimes dusky, the thighs without teeth.

Grassy places, and in oak woods, occasional. Braid Wood. Granton. Rosslyn.

C. rúber.—Brownish-black, elytra testaceous, clouded with ashy scales; rostrum black, reddish at the apex. 1¾.—*Steph. Cur. ruber, Marsh.*

Resembles the preceding too closely, but is rather of a larger size, and the markings on the elytra are less distinctly disposed in lines: head and thorax pale brownish-black, rostrum of a similar hue, the apex reddish: under side black; legs pale ferruginous, the thighs without teeth.

Grassy places and under trees, occasional. This insect and *C. melanorhynchus* are regarded by Gyllenhal as varieties of C. Quercus, and Mr Stephens conjectures that another, very closely allied, *C. rufirostris*, may eventually prove not to be specifically distinct.

C. rubicúndus.—Black, with cinereous scales, elytra testaceous, the suture dusky, and covered with whitish scales towards its base. ¾–1.—*Cur. rubicundus, Payk. Gyllen.*

More convex than either of the preceding: head and rostrum blackish, thickly punctured, the former clothed with ashy scales: antennæ rufescent, the club obscure: thorax deeply impressed across the front, the anterior margin a little elevated, deeply punctured, the disk in general rather naked, the sides and under surface thickly squamose: elytra testaceous red, the suture usually blackish, and having a covering of white scales towards the scutellum; deeply punctate-striate, the interstices irregularly marked with longitudinal patches of white scales, which, however, are often more or less abraded: under side black, with white hairs: legs ferruginous, the thighs without teeth.

Woods about Rosslyn, and elsewhere, in the months of May, June, and July, but not of frequent occurrence.

C. Sisýmbrii.—Black, with a covering of white scales, the elytra variegated with fuscous marks. 1½–1¾.—*Rh. Sisymbrii, Fab. Gyllen. Nedyus Sisymbrii, Steph. Illus.* iv. pl. 20. f. 2.

Body densely clothed with whitish scales, beneath which the surface is black; head punctured and scaly; rostrum long, slender, much curved, of a shining black colour, and minutely punctured: antennæ likewise black: thorax somewhat depressed above, thickly punctulated, and having a channel down the middle, the sides thickly covered with white scales, which are more or less rubbed off from the back: elytra finely punctate-striate, with a covering of white scales and several fuscous marks, the humeral elevation black and glabrous: under side and legs black, with white scales.

Not common. Cramond.

b. *Thighs dentate.*

C. Troglodýtes.—Reddish-brown, clothed with whitish scales beneath, the spaces between the striæ on the elytra with a row of muricated scales. 1-1½.—*Cur. Troglodytes, Marsh.*

Reddish-brown; head punctured and scaly; the rostrum reddish-brown, marked with short striæ and punctures; antennæ testaceous-red: thorax gradually narrowed to the front which has the margin much elevated with a notch in the middle, the surface covered with large punctures and cinereous scales, which form three longitudinal lines, the centre channelled: elytra punctate-striate, the punctures rather distant and deeply impressed, each interstice with a row of erect whitish scales: the apex with a series of small tubercles: under side piceous or pale reddish brown, with white scales: legs testaceous; the thighs dentate.

Var. b. Glabrous above, the suture dusky, legs, antennæ and rostrum rufous.—*Cur. Pusio, Panz. Nedyus Pusio, Steph.*

In sandy fields among the herbage, and on wall tops, &c., not unfrequent. King's Park, and on the sides of Arthur's Seat. Walls about Craiglockhart, &c.

B. *Thorax with a tubercle on each side.*

a. *Thighs without a tooth.*

C. assímilis.—Leaden-black, sparingly pubescent above, and clothed beneath with ashy scales, elytra punctate-striate, the interstices coriaceous. 1¼-1½.—*Cur. assimilis, Marsh. Nedyus assimilis, Steph.*

Upper surface rather sparingly clothed with short ashy hairs: rostrum very long and slender, shining black, much bent, and punctured at the base: antennæ pitch-black: thorax much narrowed in front, the anterior margin elevated and reflexed, with a tubercle on each side, rather behind the middle, and a wide channel down the centre, the disk thickly punctured and thinly covered with ashy pile: elytra rather long, of a leaden-black colour, punctate-striate, the interstices coriaceous, the apical tubercle obsolete: under side covered with ashy-white scales; legs black, pubescent, the thighs simple.

Rather common; occurring on plants, wall tops, trunks of trees, &c.: during the summer months. It is this insect which occasions the knobs on the roots of *Sinapis arvensis,* and *Raphanus Raphanistrum;* and it is probably either it or an allied species which injures, in a similar way, the roots of the common garden cabbage.

C. Erýsimi.—Black, strongly tinted with brassy, elytra bright blue or greenish, punctate-striate, the interstices smooth. 1-1¼.—*Rh. Erysimi, Fab. Gyllen. Cur. Erysimi, Marsh.*

Considerably less than the preceding; head black, tinted with brassy, and rather deeply punctured; rostrum slender, much curved and slightly punctured at the base; antennæ black: thorax the colour of the head, deeply punctured, with a dorsal groove and a blunt inconspicuous tubercle on each side: elytra bright blue or greenish, the shoulders prominent, deeply puncovate and acuminated, consisting of 4 or 5 joints: rostrum rounded and filiform, curved, received into a groove in the underside of the thorax; the latter small, somewhat conic, narrowed or coarctate in front, bisinuated behind, having a groove beneath, which is more or less elongate: elytra subtriangular, the apex of each rounded, rather shorter than the abdomen: thighs clavate: tibiæ truncate at the apex, and without spines; tarsi spongy beneath, the penultimate joint bilobed.

A. *Thorax without tubercles.*

a. *Thighs without a tooth on the under side.*

C. Quércus.—Brownish-black, with cinereous scales, elytra testaceous, with three waved transverse bands of cinereous scales. 1¼.—*Cur. Quercus, Herbst.*

Head minutely punctured and scaly; rostrum blackish, received into a deep groove in the breast, extending to the mid legs; antennæ ferruginous, dusky at the tip: thorax with a transverse impression anteriorly, the frontal margin a little elevated, the disk punctured, the sides and under surface thickly covered with ashy scales: elytra testaceous, sometimes rather obscure, with three narrow waved lines of whitish scales across the disk, somewhat faintly punctate-striate, and having a very obsolete tubercle near the apex: under side black, punctured and scaly: legs ferruginous, sometimes dusky, the thighs without teeth.

Grassy places, and in oak woods, occasional. Braid Wood. Granton. Rosslyn.

C. rúber.—Brownish-black, elytra testaceous, clouded with ashy scales; rostrum black, reddish at the apex. 1¾.—*Steph. Cur. ruber, Marsh.*

Resembles the preceding too closely, but is rather of a larger size, and the markings on the elytra are less distinctly disposed in lines: head and thorax pale brownish-black, rostrum of a similar hue, the apex reddish: under side black; legs pale ferruginous, the thighs without teeth.

Grassy places and under trees, occasional. This insect and *C. melanorhynchus* are regarded by Gyllenhal as varieties of C. Quercus, and Mr Stephens conjectures that another, very closely allied, *C. rufirostris*, may eventually prove not to be specifically distinct.

C. rubicúndus.—Black, with cinereous scales, elytra testaceous, the suture dusky, and covered with whitish scales towards its base. ¾–1.—*Cur. rubicundus, Payk. Gyllen.*

More convex than either of the preceding: head and rostrum blackish, thickly punctured, the former clothed with ashy scales: antennæ rufescent, the club obscure: thorax deeply impressed across the front, the anterior margin a little elevated, deeply punctured, the disk in general rather naked, the sides and under surface thickly squamose: elytra testaceous red, the suture usually blackish, and having a covering of white scales towards the scutellum; deeply punctate-striate, the interstices irregularly marked with longitudinal patches of white scales, which, however, are often more or less abraded: under side black, with white hairs: legs ferruginous, the thighs without teeth.

Woods about Rosslyn, and elsewhere, in the months of May, June, and July, but not of frequent occurrence.

C. Sisýmbrii.—Black, with a covering of white scales, the elytra variegated with fuscous marks. 1½–1¾.—*Rh. Sisymbrii, Fab. Gyllen. Nedyus Sisymbrii, Steph. Illus.* iv. pl. 20. f. 2.

Body densely clothed with whitish scales, beneath which the surface is black; head punctured and scaly; rostrum long, slender, much curved, of a shining black colour, and minutely punctured: antennæ likewise black: thorax somewhat depressed above, thickly punctulated, and having a channel down the middle, the sides thickly covered with white scales, which are more or less rubbed off from the back: elytra finely punctate-striate, with a covering of white scales and several fuscous marks, the humeral elevation black and glabrous: under side and legs black, with white scales.

Not common. Cramond.

b. *Thighs dentate.*

C. Troglodýtes.—Reddish-brown, clothed with whitish scales beneath, the spaces between the striæ on the elytra with a row of muricated scales. 1-1½.—*Cur. Troglodytes, Marsh.*

Reddish-brown; head punctured and scaly; the rostrum reddish-brown, marked with short striæ and punctures; antennæ testaceous-red: thorax gradually narrowed to the front which has the margin much elevated with a notch in the middle, the surface covered with large punctures and cinereous scales, which form three longitudinal lines, the centre channelled: elytra punctate-striate, the punctures rather distant and deeply impressed, each interstice with a row of erect whitish scales: the apex with a series of small tubercles: under side piceous or pale reddish brown, with white scales: legs testaceous; the thighs dentate.

Var. b. Glabrous above, the suture dusky, legs, antennæ and rostrum rufous.—*Cur. Pusio, Panz. Nedyus Pusio, Steph.*

In sandy fields among the herbage, and on wall tops, &c., not unfrequent. King's Park, and on the sides of Arthur's Seat. Walls about Craiglockhart, &c.

B. *Thorax with a tubercle on each side.*

a. *Thighs without a tooth.*

C. assímilis.—Leaden-black, sparingly pubescent above, and clothed beneath with ashy scales, elytra punctate-striate, the interstices coriaceous. 1¼-1½.—*Cur. assimilis, Marsh. Nedyus assimilis, Steph.*

Upper surface rather sparingly clothed with short ashy hairs: rostrum very long and slender, shining black, much bent, and punctured at the base: antennæ pitch-black: thorax much narrowed in front, the anterior margin elevated and reflexed, with a tubercle on each side, rather behind the middle, and a wide channel down the centre, the disk thickly punctured and thinly covered with ashy pile: elytra rather long, of a leaden-black colour, punctate-striate, the interstices coriaceous, the apical tubercle obsolete: under side covered with ashy-white scales; legs black, pubescent, the thighs simple.

Rather common; occurring on plants, wall tops, trunks of trees, &c.: during the summer months. It is this insect which occasions the knobs on the roots of *Sinapis arvensis*, and *Raphanus Raphanistrum;* and it is probably either it or an allied species which injures, in a similar way, the roots of the common garden cabbage.

C. Erýsimi.—Black, strongly tinted with brassy, elytra bright blue or greenish, punctate-striate, the interstices smooth. 1-1¼.—*Rh. Erysimi, Fab. Gyllen. Cur. Erysimi, Marsh.*

Considerably less than the preceding; head black, tinted with brassy, and rather deeply punctured; rostrum slender, much curved and slightly punctured at the base; antennæ black: thorax the colour of the head, deeply punctured, with a dorsal groove and a blunt inconspicuous tubercle on each side: elytra bright blue or greenish, the shoulders prominent, deeply punc-

Has occurred among the debris of Salisbury Craigs, where the Echium vulgare grows so abundantly. It is rather scarce.

Besides the above, the following species of Ceutorhynchi are known to inhabit Scotland.

C. Gerānii, Dumfries-shire, Roxburgh-shire, and other southern counties, occasional.

C. rufiróstris, "Raehills," ***Steph. Illus.***

C. Urtícæ, "Raehills," ***Steph. Illus.***

C. melanocéphalus, Near Inverary, Argyllshire.

C. Cochleáriæ, Roxburgh-shire near Cavers.

C. rugulósus, "Raehills," ***Steph. Illus.***

Genus—CRYPTORHÝNCHUS, ***Illig.*** **From** ***κϱυπτω, to conceal,*** **and** ***ῥύγχος, the rostrum.*****—Antennæ scarcely so long as the head and thorax, 12-jointed, the radical joint reaching nearly to the eyes, the remainder obconic, diminishing in length to the 9th, which forms the base of a compact oblong-ovate club: rostrum rather longer than the thorax, received into a groove in the breast, extending to the middle pair of legs: thorax much narrowed in front: elytra about one half wider than the thorax, somewhat ovate, convex, attenuated behind, and covering the abdomen: legs long; thighs clavate; tibiæ compressed; tarsi elongate, spongy beneath, the penultimate joint deeply bilobed.**

C. Lápathi.—Dull black, the elytra with a band across the base and the apex, clothed with white scales, the disk with fascicles of black scales. 4½–5½.—*Cur. Lapathi, Linn. Rhyn. Lapathi, Fab. Gyllen.*

Head dull black, punctured, the forehead with erect black scales; antennæ dusky ferruginous; rostrum arched, punctured, the apex smooth and glossy: thorax bisinuated at the base, rugosely punctured, with a ridge down the middle, two elevated tufts of black scales at the anterior margin, and three larger ones across the middle; the scales on the sides and beneath whitish: elytra elongated, very convex, each with a tubercle near the apex, dull black, deeply punctate-striate, the interstices rugose; a broad band across the base, interrupted at the suture, and the whole apex of the elytra, covered with white scales: under side black, the breast squamose, the abdomen nearly naked; legs black, the thighs with a white ring; the latter likewise armed with two teeth.

Rare near Edinburgh. Coates. It frequents willow and alder trees.

Genus — ÁMALUS, *Schoen.* From *ἀμαλὸς tender.*—Antennæ the length of the head and rostrum, 11-jointed, basal joint not extending to the eyes, 2d obconic, thick, 3d and 4th more slender, obconic, 5–7 somewhat rounded, the club oblong-ovate, acuminated, 4-jointed: rostrum slender, cylindric, arched, not received into a pectoral groove: thorax transverse, narrow in front, bisinuated behind: elytra subovate, convex, shorter than the abdomen: legs rather long and stout; thighs and tibiæ without spines.

A. scortíllum.—Black above, clothed with white scales beneath, legs and apex of the elytra rufous, the latter with a patch of white scales at the base of the suture. 1–1¼.—*Rhyn. scortillum, Gyllen. Cur. inflexus, Marsh.*

Rostrum about the length of the head and thorax, glossy-black, minutely punctured; antennæ pitch-red, the club dusky: thorax black, closely and deeply punctured, with short scattered ash-coloured hairs in the middle, and white scales on the sides and under surface: elytra black at the base, rufous towards the apex, deeply punctate-striate, the interstices with a few scattered hairs; the base of the suture clothed with white scales: under side black, likewise covered with white scales: legs testaceous-red.

Taken occasionally among grass on wall tops, and in fields. Craiglockhart. Fields near Morton Hall.

GENUS — **ORCHÉSTES**, *Illig.* From ὀρχηστὴς *a leaper.* — Antennæ short and rather slender, inserted near the middle of the rostrum, 11-jointed, the 1st joint clavate, reaching almost to the eyes, 2d stout obconic, 3d slender obconic, the 4 following short, the rest forming an ovate club: rostrum elongated, rather thick, rounded, arcuate and bent beneath the breast: eyes large, round, and rather prominent, the internal margins almost touching each other: thorax small, somewhat conic, slightly coarctate in front, the sides rounded: elytra oblong-ovate, the shoulders forming an obtuse angle, the apex rounded, and generally leaving the extremity of the abdomen exposed: hinder thighs thickened, formed for leaping.

O. Quércus.—Testaceous-red, densely pubescent, eyes, breast, and base of the abdomen black. 1½–1¾.—*Cur. Quercus, Linn. Rhyn. viminalis, Fab. Gyllen. Cur. rufus, Don,* xi. 389, f. 3.

Entirely rufo-testaceous above: head very small, pubescent, the eyes, which are blackish, occupying all the anterior part; rostrum as long as the head and thorax, somewhat shining, obsoletely striated, and, as well as the antennæ, entirely rufous: thorax with thick pale depressed pubescence, intermixed with darker erect hairs, the centre obsoletely channelled; the base bisinuated: elytra double the breadth of the thorax, suddenly depressed near the apex, slightly convex and punctate-striate, having a wide common triangular mark of pale coloured pubescence, extending from the shoulder beyond the middle of the suture, along the margin of which it is sometimes continued, and again dilated at the apex, leaving a broad lateral space on each elytron, nearly free from pubescence, and deeply ferruginous: breast black, sparingly pubescent, base of the abdomen also black, the apex testaceous: legs pale rufous, the hinder thighs very thick, with two rows of small spines.

Inhabits the oak, but is not very plentiful in Scotland. Braid Wood. Woods near Craigie Hall, and about Cramond.

O. Fági.—Black, unspotted, clothed with thin fuscous pubescence, antennæ and tarsi pale testaceous. 1–1½.—*Cur. Fagi, Linn. Cur. rhododactylus* and *Fragariæ, Marsh. Rh. Fagi, Gyllen.*

Oblong, rather narrow, and not very convex, black, with fine fuscous hairs, which sometimes change into green: head and rostrum nearly free from pubescence, and rather ruggedly punctured: antennæ short, pale testaceous: thorax short, much narrowed in front, the sides rounded, thickly punctate, and obsoletely channelled down the back: elytra scarcely twice the breadth of the thorax, elongate-oblong, punctate-striate, rounded at the apex, and covering the extremity of the abdomen: under side of the body and legs the colour of the upper surface, the tarsi pale testaceous; the four anterior thighs having a minute spine in the centre beneath, the posterior pair thick, angulated, armed with a single spine, and a few strong ciliæ.

Found abundantly in every wood round Edinburgh during the spring and summer. It occurs on the beech, as the specific name indicates.

It was said by Fabricius to inhabit the strawberry; but as it is plentiful in this country, and is never found on that plant, it is not unlikely that the error may have arisen from its having fallen on that lowly fruit from the overhanging branch of some "broad spreading beech-tree."

SUBGENUS—TACHYÉRGES, *Schoen.* From ταχυεργὴς, one performing any action speedily.—Antennæ 12-jointed, basal joint thick and straight, 2d large, obconic, 3d and 4th oblong, obconic, remainder short, club thick, oblong-ovate; rostrum one-half longer than the head, or upwards, rather thick, rounded and bent inwards; in other respects not differing materially from *Orchestes.*

T. Sálicis.—Deep black, the scutellum, and two undulated transverse bands on the elytra, white. 1¼.—*Cur. Salicis, Linn. Marsh.*

Head and rostrum coarsely punctate, the latter rather thick, and slightly arcuate; antennæ pitchy-red, the club obscure: thorax small, very narrow in front, somewhat depressed above, dull black, and rugosely punctured, with a dorsal line of greyish hairs: scutellum covered with snow-white hairs: elytra more than double the breadth of the thorax, scarcely convex above, deep black, somewhat shining, and punctate-striate, with a transverse waved band of white hairs before the middle, dilated on the suture anteriorly, and emitting a projecting angle behind, the central part frequently tawny; the posterior band narrow and abbreviated, sometimes broken into spots, the extremities bent forward: under side of the body and legs black, the hinder thighs not much thickened, and without teeth.

Found on willows occasionally. Near Cramond. Rosslyn, on the *Salix Russelliana.*

T. Stígma.—Deep black, the scutellum covered with snow-white pile. —*Salius Stigma, Germ. Rhyn. Iota, Fab. Gyllen.*

Wholly deep black, somewhat shining, except the sides of the thorax and under surface, which are covered with fine cinereous pubescence, and the scutellum, which is densely clothed with white pile: head small, the front occupied by the eyes, which are united; rostrum coarsely punctured; antennæ black, the club slightly pubescent: thorax rather dull black, thickly and roughly punctured: elytra deeply punctate-striate, the interstices convex and slightly wrinkled across: legs black, slightly pubescent.

Frequents the leaves of various trees, rather rare. Once taken on an alder near Duddingston. In Roxburghshire, where it is more frequent than in this neighbourhood, it is usually observed on the hazel.

T. Ilicis has been found several times in Scotland, but not within the limits of the Edinburgh district.

GENUS—BALÁNINUS, *Germar.* From βαλάνινος, produced from an acorn.—Antennæ a little longer than the head and rostrum, 12-jointed, radical joint reaching to the eyes, its apex dilated, next two obconic, the remainder short, the club distinctly 4-jointed, ovate: rostrum nearly the length of the body or longer, filiform, very slender, arched: thorax oblong, subconic: scutellum elevated: elytra when united subcordate or triangular, the shoulders rather prominent: legs rather long and stout; the thighs clavate, tibiæ nearly cylindrical, the apex of the anterior pair armed with a minute hook.

B. Salicívorus.—Black, clothed above with cinereous pubescence, scutellum and under side with white scales, radical joint of the antennæ dull ferruginous. 1¾.—*Cur. salicivorus, Payk. Rhyn. salicivorus, Gyllen. Cur. arcuatus, Marsh.*

Black, thinly clothed above with cinereous hairs and scales: head minutely punctured; eyes large, brownish; rostrum of the female glossy, nearly smooth; that of the male striated at the base; antennæ with the radical joint ferruginous: thorax minutely punctured, appearing granulated, with thinly scattered cinereous hairs, which form three small spots on the hinder margin, of which the central one is triangular: scutellum covered with white scales: elytra deeply punctate-striate, the interstices faintly wrinkled, and each marked with two rows of small depressed ash-coloured scales; under side black, densely covered with white scales of a rounded form: legs black, the thighs dentate.

Not common. It usually frequents willow trees, and is frequently found on the flowers of cabbage, and other oleraceous plants. Once taken in great plenty at Rosslyn in the month of May.

GENUS—ANTHÓNOMUS, *Germar.* From *ἄνθος, a flower*, and *νομὸς, a feeder.*—Antennæ half the length of the body, 12-jointed, 1st joint reaching nearly to the eyes, 2d and 3d rather long, 4–8 shorter, obconic, the club elongate, rather narrow, acuminated at the apex, distinctly 4-jointed: rostrum half the length of the body, slender, filiform, a little curved: thorax somewhat conic, much narrowed in front: scutellum elevated: elytra large, much widest behind, and very convex: legs long, especially the anterior pair; thighs thick, dentate.

A. Pomórum.—Piceous, with cinereous pubescence, elytra ferruginous, with an oblique whitish fascia behind the middle. 1½–2¼.—*Cur. Pomorum, Linn.*

Head pitch-black, punctured and pubescent, with an impression between the eyes, rostrum of the same colour, pubescent at the base, punctured; that of the female long, minutely punctured, and nearly glabrous; antennæ ferruginous: thorax with the anterior margin slightly elevated, the disk thickly punctured, dull pitch-red, with a line of cinereous pile down the middle, and another, slightly curved, on each side: scutellum elevated, covered with long whitish pile: elytra punctate-striate, dusky ferruginous, with an oblique transverse band of whitish pubescence behind the middle: under side blackish, the segments of the abdomen edged with ferruginous: legs ferruginous-red, the thighs blackish in the middle, the anterior pair armed with a large strong tooth, which is rather obsolete in the others.

On wall-tops, and trees in gardens, occasional. It hybernates beneath lichens and the bark of trees. Cramond Bridge. Restalrig. Rosslyn, &c.

A. Rúbi.—Black, with fine cinereous pubescence, the base of the antennæ, the joints of the legs and the tarsi, pitchy; scutellum white. 1½.—*Rhyn. Rubi, Gyllen. Cur. melanopterus, Marsh.*

Head black, minutely punctured, thinly pubescent, and impressed between the eyes; rostrum black, with a faint ridge down the front: antennæ slightly reddish at the base, the apex black: thorax dull black, very thickly covered with minute granulations, and a few fine cinereous hairs: scutellum covered with white pubescence: elytra black, with fine scattered hairs, rather deeply punctate-striate: under side the colour of the upper surface: legs black, the base of the thighs and the tarsi obscurely pitchy; each of the thighs with a very minute tooth near the apex.

In hedge-rows, gardens, &c.: not unfrequent in summer.

A. áter.—Black, with thinly scattered pubescence, scutellum, antennæ, and legs, likewise black. 2.—*Steph. Cur. ater, Marsh.*

Generally rather larger than the preceding, from which it differs chiefly in having the scutellum, antennæ, and legs entirely black, in uniformity with the rest of the body: head punctulated; rostrum dull black, rather rough, thorax likewise dull black, somewhat wrinkled: elytra deeply punctate-striate.

Not common. Individuals have occurred at Lasswade.

GENUS—HYDRÓNOMUS, *Schoen.* From *ὕδωϱ, water,* and *νομος, a feeder.*—Antennæ a little longer than the head and rostrum, inserted behind the middle of the latter, stout, 12-jointed, the 1st joint not reaching to the eyes, the 2d obovate, thick, 3d obconic, slender at the base, 4–8 short, coarctate, gradually increasing in diameter, the rest forming a short, ovate, pointed club: rostrum rather long, somewhat thickish and arcuate: thorax narrow, subcylindric, widely emarginate in front, lobed behind the eyes: elytra broader than the thorax, and thrice as long, attenuated at the apex, the shoulders forming an obtuse angle: thighs thickened in the middle, the tibiæ much bent, the apex armed on the inner side with a strong hook.

H. Alísmatis.—Black, variegated with cinereous scales, the antennæ and tibiæ dull testaceous. 2.—*Cur. Alismatis, Marsh. Rhyn. Alismatis, Gyllen.*

Head short, partially retracted within the thorax, the forehead with a small linear impression; rostrum about the length of the thorax, finely punctulated and black, except where covered with ashy scales; antennæ ferruginous, the club, and apex of the basal joint, dusky: thorax finely punctulated, and clothed with cinereous scales, having a very faint dorsal groove, and an obsolete impression on each side: elytra a little convex, punctate-striate, the interstices coriaceous, black, irregularly clouded with cinereous scales, having an oblique white mark in the middle of the back towards the suture: under side black, squamose; legs rather long, dull ferruginous, the thickened part of the thighs and the tarsi fuscous-black.

On the *Alisma Plantago,* Water Plantain, and other aquatic plants in the pond of the Botanic Garden, rather plentiful for some years back: scarce elsewhere. Duddingston Loch, sparingly.

GENUS—GRYPÍDIUS, *Schoen.* From *γϱυπὸς,* in allusion to the curvature of the rostrum.—Antennæ rather long and slender, 1st joint reaching to the eyes, 2d and 3d rather long, obconic, 4–8 short, nodose, equal, the club oblong-ovate: rostrum elongate, slender, bent: thorax scarcely longer than the breadth in the middle, the sides equally rounded, having distinct lobes behind the eyes: scutellum elevated, very minute: elytra subovate, the shoulders slightly prominent, the hinder part very convex or gibbous: thighs without teeth; tibiæ nearly straight, the apex of the anterior pair armed with a small hook internally.

G. Equiséti.—Black, the sides of the thorax and of the elytra, together with the apex of the latter, and a spot on the disk of each, covered with dull yellowish scales. 4.—*Rhyn. Equiseti, Fab. Gyllen. Cur. Equiseti, Marsh.*

Head convex, black, punctured, with greyish or yellowish pile; rostrum half the length of the body, much curved, punctured, black, glabrous and shining; antennæ pitch-black, or slightly rufescent: thorax rugosely punctured, with an impression before the scutellum, the sides clothed with whitish and yellowish scales, leaving a broad dull black space on the back which is narrowed in front: elytra very obscurely punctate-striate, the interstices coriaceous, the alternate ones with elongate tubercles, the sides covered with ashy or yellowish scales which form a projecting angle internally, the apex widely clothed in a similar manner, and the disk with a small spot near the middle: under side black, punctured, with a few scattered scales: legs blackish, the thighs with a ring of pale hairs; tibiæ obscurely ferruginous.

Said to frequent the *Equisetum arvense*, Corn horse-tail: it is not common.

GENUS—ERIRHÍNUS, *Schoen.* From *ῥὶν*, *the nose*, and the particle *ἐρι*, used to increase its signification.—Antennæ rather long, slender or somewhat stout, inserted behind the middle of the rostrum, 12-jointed, the radical joint reaching nearly to the eyes, 2d and 3d rather long, obconic, 4–8 short, nodose, nearly equal, the club 4-jointed, oblong-ovate, acuminated at the apex: rostrum a little longer than the head and thorax, cylindric, bent, generally filiform: thorax narrowest in front, subtruncate before and behind, the sides dilated in the middle, more or less lobed behind the eyes: elytra oblong, generally with a callosity towards the apex: legs strong, the thighs thickened in the middle, the anterior tibiæ armed at the apex with a minute hook.

A. *Thighs without teeth.*

E. acrídulus.—Black, antennæ and legs rufescent, elytra deeply punctate-striate. 2–2½.—*Cur. acridulus, Linn. Cur. resinosus, Marsh. Notaris acridulus, Steph.*

Deep black: head rather convex, punctured; rostrum as long as the head and thorax, shining black, punctured or substriated; antennæ ferruginous, dusky and pubescent towards the tip: thorax covered with large rounded punctures, which leave a narrow, smooth, scarcely elevated line down the middle: elytra a little convex above, narrowed behind, black, or brownish-black, rather deeply punctate-striate, the interstices with cross wrinkles: under side shining black, thickly punctured: legs testaceous-red, the thighs often obscure.

Not unfrequent under stones and on plants, particularly in moist and marshy places. Braid Hills. Margin of Duddingston Loch, &c.

B. *Thighs dentate beneath.*

E. Tórtrix.—Pale testaceous, with fine pubescence, the breast and apex of the rostrum dusky black, the latter of moderate length.—*Cur. Tortrix, Linn. Marsh. Rhyn. Tortrix, Fab. Gyllen. Dorytomus Tortrix, Steph.*

Body entirely pale testaceous, thinly clothed with short fine pubescence: head and rostrum shining, the former thickly punctulated, with a small impression between the eyes, the latter not very long, and dusky at the tip; antennæ pale: thorax contracted in front, the sides rounded, moderately convex, and rather thickly punctured, with a faint ridge down the middle: elytra punctate-striate, the interstices marked with very minute obsolete punctures: under side pale testaceous, punctulated, the breast dusky, with pale pubescence: legs of a more yellowish hue than the rest of the body.

Frequents the common Poplar (*Populus tremula*), but is far from common. Woods at Hawthornden. Cramond.

E. Trémulæ.—Dusky ferruginous, with cinereous pubescence, rostrum black, somewhat striated, elytra variegated with cinereous pubescence and irregular black markings. 2–2¾.—*Rhyn. Tremulæ, Gyllen. Dorytomus Tremulæ, Steph.*

Head dusky ferruginous, minutely punctured, with a small impression between the eyes; rostrum nearly half the length of the body, shining black, arched, and marked with short interrupted striæ; antennæ pale: thorax dusky testaceous, punctured and pubescent, the disk nearly glabrous: elytra punctate-striate, obscurely ferruginous, variegated with cinereous pubescence and irregular markings of a blackish colour: under side dusky ferruginous, thinly pubescent, the breast more obscure: legs ferruginous, the apex of the thighs sometimes dusky.

Frequents willow and poplar trees; found not unfrequently in this district. Among grass in woods at Rosslyn in the month of June, rather plentiful.

E. maculátus.—Obscure dusky ferruginous, a band across the middle of the thorax, and the disk of the elytra, dusky piceous.—*Cur. maculatus, Marsh. Rhyn. Tremulæ, var. b. Gyllen. Dorytomus fumosus, Steph. Illus.*

Similar to the last, from which it is probably not specifically distinct: head and thorax dusky piceous, the latter testaceous-red on the front and behind: elytra pitchy-brown, variegated with cinereous pubescence, the suture and margin dusky ferruginous, the disk of each elytron with two small whitish spots towards the apex, placed one behind the other: in other respects like *E. Tremulæ.*

Has been observed near Lasswade, Cramond, and in a few other situations.

GENUS—PISSÓDES, *Germar.* Named from πισσώδης, *pitchy.*—Antennæ scarcely longer than the head and rostrum, inserted behind the middle of the latter, rather stout, 12-jointed, 1st joint reaching nearly to the eyes, 2d short, obconic, 3–8 short, gradually increasing in diameter, the club rather thick, 4-jointed, ovate, acuminated at the apex: rostrum as long as the thorax, or longer, slender, rounded, and bent: thorax much narrowed anteriorly, bisinuated behind: elytra oblong, with a callosity towards the apex; legs strong; thighs clavate, without teeth; tibiæ provided with a strong nearly horizontal hook on the inner side.

P. Píni.—Pitch-red, rostrum sub-ferruginous, elytra deeply punctate-striate, with two abbreviated spotted fasciæ of yellowish scales. 4–4¼. *Cur. Pini, Linn. Rhyn. Pini, Leach; Edin. Encyc.*

Deep pitch-red: head convex, minutely punctured, with an impression on the forehead; rostrum rather paler than the head, approaching to ferruginous, glabrous, shining, and finely punctured, the tip blackish; antennæ nearly the colour of the rostrum, or a little more obscure, especially towards the tip: thorax scarcely wider than the head in front, the sides dilated, and the base nearly as wide as the elytra; slightly convex, rugosely punctured, having a narrow obsolete ridge down the centre, a small fovea near the middle of the disk on each side, and a larger one before the scutellum, which are usually filled with yellowish pile; there is likewise an oblique linear patch of yellow pile within the margin on each side, and a small spot towards the middle; the colour deep pitch-red, with thinly scattered yellowish pile: scutellum with whitish scales: elytra the colour of the thorax, or of a paler hue, deeply punctate-striate, the punctures of an oblong-quadrate form, with rugose interstices, and an indistinct tubercular elevation before the apex; the disk adorned with two fasciæ, one before the middle formed by three approximating spots of yellow scales, the other behind the middle and composed of six or eight spots: under side pitch-black, deeply punctured: legs generally pitchy-red, the thighs near the apex and the middle of the tibiæ with a ring of whitish scales.

This fine species has been taken several times near Edinburgh, but it is very scarce. It is found in fir-woods, frequenting the leaves of the trees, and the resinous exudations from their stems. It appears to be confined to the more northern parts of Europe, and in this country probably does not extend further south than Scotland. It is not a rare insect in Sweden, and it is not unlikely that the pine woods in our Highland districts will yield in some plenty, as we have seen several specimens from Inverary, Braemar, Atholl, and a few other places.

P. notátus.—Pitch-red, rostrum pitch-black, elytra rather finely punctate-striate, with two abbreviated fasciæ of whitish or yellowish scales. 3–3½.—*Lixus notatus*, *Fab.* *Cur. notatus*, *Herbst.*

Very similar to the preceding, but usually of a smaller size and sufficiently different in other particulars: head pitchy-red, rostrum black, both minutely punctured, the forehead with a small impression; antennæ piceous, rather pale at the base: thorax pitch-red, thickly punctured, with a pretty distinct ridge down the middle, sprinkled with whitish scales, which form four small spots placed transversely: scutellum with white scales: elytra pitch-red with numerous small scales, the striæ composed of punctures similar in form to those of *P. Pini*, but smaller and much less deeply impressed, and rather obsolete towards the outer margins; having a rather wide abbreviated fasciæ of white or yellowish scales before the middle, and another behind, which is produced anteriorly in the centre; under side and legs as in *P. Pini*.

This species is stated by Mr Stephens to have been taken in Ravelston Wood by Dr Leach. It is certainly very rare in Scotland.

P. Fabrícii.—Pitch-red, clothed with pale yellowish scales, rostrum pitchy ferruginous, elytra not very deeply punctate-striate, and having two interrupted fasciæ of pale yellow scales. 4½.—*Steph. Illus.* pl. xxi. f. 1.

"Elongate, rufo-piceous, with pale lutescent scales; rostrum rusty-piceous, slender: thorax coarsely punctured, a little glossy, with a distinct dorsal carina, and four transverse luteous spots on the disk, as in the former species: scutellum luteous: elytra elongate, not very deeply punctate-striate, the alternate interstices not elevated, the disk sparingly sprinkled with minute flavescent scales, with an interrupted fascia towards the base, and a second slender one behind the middle, of similar scales: legs dusky-piceous, with an indistinct whitish ring of scales round the tibiæ."—*Steph. Illus.*

Mr Wilson once took this fine insect in Ravelston Wood, and communicated the specimens to Dr Leach, by whom they were distinguished by the above specific name. Other specimens from Scotland are said to be preserved in the British Museum, but we have heard of only one instance of its recent occurrence, viz. on the banks of the South Esk near Montrose.

GENUS—HÝPERA, *Germar.* *ὕπερα* is a name applied by Aristotle to some kind of insect, but it is impossible to identify the species.—Antennæ inserted towards the apex of the rostrum, 12-jointed, 1st joint reaching nearly to the eyes, two following rather long and clavate, equal in length, next three subglobose, 7th and 8th transverse, the remainder forming a compact ovate club: rostrum twice the length of the head, rather thick and slightly bent: thorax somewhat orbicular, truncate before and behind: elytra oblong or short ovate, twice as broad as the thorax, somewhat conical at the apex: thighs slightly clavate; anterior tibiæ curved; tarsi with the penultimate joint bilobed, the unguicular one longest.—*Curtis, B. E.* iii. 16.

H. punctáta.—Dull black, clothed with greyish scales, thorax widest anteriorly, with three pale lines on the upper surface, the elytra having the alternate interstices marked with dusky spots; legs dusky black. 4–4¾.—*Cur. punctatus, Fab. Cur. medius* and *Cur. Austriacus, Marsh.*

The largest species of the genus: ground colour black, the surface more or less punctured; head and rostrum with fuscous pubescence, the latter thick and slightly bent; antennæ obscure pitch-red: thorax considerably widened anteriorly, rather narrower behind, convex, the sides covered with cinereous hair-like scales, variegated with others of a fuscous colour, the disk more obscure, with a cinereous line, often scarcely observable, down the centre: elytra large, ovate, rounded at the shoulders, somewhat depressed above, closely and deeply punctate-striate, the sutural interstice, and the 3d, 5th, and 7th, rather wider and more elevated than the rest, and more or less marked with alternate spots of fuscous and cinereous scales; the lateral margins of the elytra broadly cinereous and generally unspotted: under side of the body and legs black, clothed with tawny-cinereous scales, the thighs variegated with fuscous: tibiæ and tarsi sometimes obscurely testaceous.

The colour of the pile is variable, and as in other species which live among stones and herbage, it is liable to be rubbed off, circumstances which occasion considerable diversity of appearance in individuals.

The insect occurs not unfrequently in sandy soils, usually beneath stones. Old quarry near the Powder Magazine in the King's Park. Shore west of Newhaven, &c.

H. fasciculósa.—Black, densely clothed with whitish and dusky scales, thorax rounded on the sides, with three pale lines above, the spaces between variegated, elytra having the alternate interstices variegated with white and black spots; tibiæ and tarsi ferruginous. 3–3½.—*Rhyn. fasciculosus, Gyllen. Hyp. fasciculosa, Curtis, B. E.* iii. 116.

Considerably less than the preceding, the elytra proportionably narrower, the surface brownish-black, minutely punctured and covered with scales: rostrum with dense whitish pile, glabrous at the tip and shining; head brownish, sometimes with a pale line on the crown; antennæ dull ferruginous, the club generally fuscous: thorax brownish, slightly variegated, with a central line, and another on each side, composed of pale greyish scales: scutellum whitish: elytra with obscure punctured striæ, the sutural interstice spotted with alternating quadrate marks of black and white, the alternate interstices more or less tessellated in a similar manner, particularly towards the apex, the scutellar angle having two short lines of deep black pubescence; the shoulders and sides more or less whitish, the latter colour forming a kind of arch near the middle of the elytra, bounded internally by a blackish line: legs reddish-brown, with hoary pubescence, the thighs variegated with a darker colour.

Under stones in sandy places, particularly along the coast, occasional. Fisherrow Links. Race-course at Musselburgh. It occurs in the south of England, where it is accounted rare. In Sweden and other northern parts of the Continent, it is not scarce.

H. elongáta.—Black, with cinereous pubescence, thorax with three obscure pale lines, elytra elongate, indistinctly spotted with dusky; legs black. 3¼–3½.—*Cur. elongata, Gyllen. Cur. fusco-cinerea, Marsh.*

Rather narrow and elongated: the ground colour brownish-black; head and rostrum minutely punctured and covered with cinereous pile; the latter rather thick and somewhat curved, with an indistinct carina down the middle; antennæ ferruginous, the club obscure: thorax pretty equally rounded, not very convex, punctured and covered with greyish pubescence, having a very indistinct line of paler hairs in the centre and another on each side: elytra not twice the breadth of the thorax, and about four times its length, somewhat depressed on the back anteriorly, rather deeply punctate-striate, clothed with small cinereous scales and hairs, the alternate interstices marked with obsolete dusky spots: under side black, sparingly pubescent and squamose: legs black with cinereous pubescence.

Rather rare in this neighbourhood, and still more so in England and other parts of Scotland. Shore east of Musselburgh, and Figget Whins near Portobello.

H. pedéstris.—Black, clothed with hairs and scales of a uniform cinereous colour, or faintly metallic; legs black. 2¾–3.—*Cur. pedestris, Payk. Gyllen.*

Head and rostrum black, punctured, with thin greyish pubescence, the forehead with a small groove between the eyes: antennæ ferruginous, the club dusky: thorax much and nearly equally rounded on the sides, rather convex, thinly covered with narrow hair-like scales of a uniform cinereous colour, sometimes with a metallic lustre in certain lights: scutellum very minute: elytra about twice the width of the thorax and scarcely thrice its length, punctate-striate, thinly clothed with cinereous pubescence and minute scales, which have frequently a metallic lustre, and without dusky spots: underside black and punctured, the scales with a silvery lustre; legs black, with ashy pubescence.

Inhabits this neighbourhood, but is very scarce. We once met with a few specimens near Caroline Park, and have seen others from the vicinity of Dalkeith. It does not appear to differ materially from H. miles (*Cur. tæniatus, Marsh*), although separated from the latter in Mr Curtis's arrangement by the intervention of half a dozen species.

H. arátor.—Fuscous, pubescent, thorax with three distinct lines of whitish scales, elytra testaceous, marked with brown lines, and a dentate line of black along the suture. 3–3½.—*Cur. arator, Linn. Rhyn. arator, Gyllen.*

Head and rostrum punctulated and clothed with delicate greyish pubescence, the forehead with a shallow impression; antennæ ferruginous, the club obscure; thorax with three distinct rows of whitish or tawny scales: elytra testaceous, with cinereous scales; the suture white anteriorly, the hinder part spotted with black, so as to make it appear dentate; each elytron having a brownish line rising from the internal basal angle and reaching nearly to the middle, another towards the apex, and a third longer than the others, extending somewhat obliquely from the apex towards the shoulder; all these lines accompanied with a narrow parallel pale or white streak: under side and legs black and pubescent.

This insect is considered by Gyllenhal to be a variety of *H. Polygoni*, and there can be little doubt about the propriety of associating it with that species. It is not common in this district, but is occasionally found in the spring in sandy fields. Musselburgh Links. Fields near Gorgie.

H. murína.—Black, with a covering of greyish scales, antennæ and tibiæ ferruginous, thorax with three shining white lines, elytra with whitish lines spotted with dusky. 3–3½.—*Cur. murina, Fab. Gyllen. Cur. Plantaginis, Marsh.*

Ground colour black; head punctulated and pubescent, the forehead with rather long cinereous pile; rostrum about the length of the thorax, rather thick, curved, and slightly pubescent; antennæ as in the preceding species: thorax rounded, rather depressed, with a broad line on each side and a narrow one in the centre composed of whitish hairs and scales which have a brassy or silvery lustre in certain lights, the central one tinted with green: elytra twice the breadth of the thorax, rather long, punctate-striate, the back fuscous, the sides and apex with a covering of whitish scales, the suture behind the middle, and the 3d, 5th, and 7th interstices, tessellated with fuscous spots: under side black, with metallic scales; thighs black, tibiæ and tarsi pale ferruginous.

Rare: sandy field between Caroline Park and Granton.

H. variábilis.—Black, with a covering of cinereous scales, thorax with two brownish lines, and a spot of the same colour on each side, antennæ and tibiæ ferruginous. 2¾–3¼.—*Rhyn. variabilis, Gyllen.*

Forehead impressed in the middle; rostrum and antennæ as in *H. murina:* thorax equally rounded on the sides, thickly punctured, dark brown, with a wide patch of shining cinereous hairs and scales on each side, in which there is a nearly naked dusky spot; the central line narrow, with a silvery lustre: elytra dark brown, the back from beyond the middle to the base nearly naked, the suture towards the apex white with black spots, the alternate spaces between the striæ likewise whitish, more or less variegated with dusky spots: under side and thighs dark brown, with ashy pubescence; tibiæ and tarsi ferruginous.

Occurring in the localities referred to under the two last species, and in other places, but not frequently. It is an abundant species in the southern parts of England.

H. Rúmicis.—Black, variegated with shining cinereous scales, thorax subcylindric, cinereous, with two dark brown lines. 3–3¼.—*Cur. Rumicis, Linn.*

Head small, punctured, clothed with narrow ash-coloured shining scales; rostrum short, rather thick and scarcely curved; antennæ obscurely ferruginous: thorax much less rounded on the sides than in the foregoing species, thickly punctured, dull black, the sides and a narrow line down the middle white, scaly: elytra with the shoulders rather prominent, punctate-striate, the ground colour black, with a covering of cinereous scales; a patch of a square form round the scutellum, and small spots scattered over the surface, dark brown: under side and legs black, with dense whitish scales and hairs; the tibiæ and tarsi sometimes inclining to ferruginous.

The elytra are at times black on the back, and have an oblong patch of white scales near the suture; the colour of the scales is sometimes testaceous or pale brown.

Frequents the various kinds of broad-leaved docks (*Rumex crispus, R. obtusifolius*), occurring not unfrequently.

H. nigriróstris.—Black, covered with a bluish-green pubescence, antennæ and legs ferruginous-yellow. 1¼–2.—*Cur. nigrirostris, Fab. Marsh.*

Upper surface covered with bluish-green pubescence, beneath which the body is black or pitchy: rostrum slightly narrowed towards the base, black, the apex glabrous; antennæ pale ferruginous, the club fuscous: thorax with three lines of pale green: elytra punctate-striate, the interstices not elevated; under side blackish, with a griseous pubescence: legs ferruginous-yellow, the thickened part of the thighs dusky.

Pretty generally distributed over the Edinburgh district, but found nowhere in such abundance as in England and some of the more southern parts of Scotland. Braid Hills. Duddingston. Figget Whins.

H. póstica.—Black, with thin cinereous pubescence, the antennæ, tibiæ, tarsi, and apex of the elytra ferruginous. 2.—*Rhyn. posticus, Gyllen. Cur. bimaculatus, Marsh.*

Head and rostrum black, somewhat shining, with thinly scattered cinereous pubescence; eyes depressed, brownish; antennæ ferruginous: thorax with the sides much dilated, nearly globose, the back a little depressed, black, thickly punctured, the sides and a narrow line down the middle clothed with cinereous hairs: elytra one-half broader than the base of the thorax, moderately convex above, rather deeply punctate-striate and sparingly pubescent, of a pitchy-black colour, the apex more or less ferruginous: under side of the body and thighs black, pubescent; tibiæ and tarsi ferruginous.

Not a scarce species on dry hilly pastures, and in sandy places. Arthur's Seat, plentiful in the months of May and June. Pentland and Blackford Hills.

Genus—MOLÝTES, *Schoenherr.* Named, in reference to their motions, from *μωλύτης. slow, sluggish.*—Antennæ rather thick, inserted towards the apex of the rostrum, 12-jointed, the radical joint not reaching to the eyes, 2d and 3d obconic, 4–7 short, transverse, somewhat rounded, gradually becoming wider, 8th cup-shaped, forming the base of the club, which is oblong-ovate, acuminated: rostrum above twice the length of the head, thick, rounded, truncate at the apex, impressed on each side with an obsolete stria ascending beyond the eyes: thorax oblong-rounded, suddenly narrowed in front, the base and apex truncate: elytra united, ovate, without a callosity towards the apex: legs rather long and robust; thighs clavate; tibiæ obliquely truncate at the apex, which is furnished with a large horizontal hook.

M. anglicánus.—Glossy black, thorax minutely punctulated, elytra equal on the surface and finely coriaceous, all the thighs with an acute tooth. 6–8.—*Cur. anglicanus, Marsh. Rhyn. Germanus, Fab. Gyllen.*

One of the largest insects of the family found in Scotland: nearly of a uniform black colour, slightly shining; head sparingly punctured, and impressed with a small line on the forehead; rostrum thickly punctured and marked with a stria on each side: thorax very slightly rounded on the sides, minutely and thickly punctured, with a smooth narrow line down the middle: elytra finely coriaceous, as if covered with small imbricated scales, the sides usually with a few yellowish hairs: under side black, somewhat shining, punctulated, the sides of the abdomen with a row of spots composed of yellow pile, breast likewise covered with yellow pile: legs black, all the thighs with a strong pointed tooth.

Apparently very rare. A few specimens have been taken in this neighbourhood by Sir P. Walker. In England it is said to be partial to chalky districts, and its rarity in Scotland may possibly be in some measure owing to the absence of the chalk formation from the latter country.

M. punctátus.—Deep glossy black, with rufous antennæ, elytra deeply punctate-striate. 1½–1¾.—*Cur. punctatus, Marsh.*

Small, shining black, rigid; rostrum long, thick, longitudinally striated, and bent inwards; head minutely punctured; antennæ ferruginous: thorax widest a little behind the front, somewhat convex, and covered with large punctures: elytra punctate-striate, the punctures large and deeply impressed: under side black and punctured; legs black, the tarsi rufescent. It sometimes occurs entirely pale red, or with the elytra only black.

Under stones, not unfrequent. King's Park. Craigmillar, &c. &c.

GENUS—**HYLÓBIUS**, *Germar*. Named from ὕλη, *wood*, and βιος, *life*. Antennæ short, rather thick, inserted near the apex of the rostrum, 12-jointed, the basal joint abruptly clavate, not reaching to the eyes, the 2d and 3d joints obconic, the 2d rather longest, the four following cup-shaped, the 8th widened and embracing the base of the 4-jointed oblong-ovate acuminated club: rostrum the length of the thorax, deflexed, rounded, the apex thickened, the sides obliquely grooved to receive the scape of the antennæ: eyes transversely oblong, not prominent: thorax coarctate in front, the sides rounded: elytra oblong-ovate, having a callosity towards the apex, the shoulders forming an obtuse angle: thighs clavate, with a single tooth; tibiæ compressed, the apex obliquely truncate, and producing a large horizontal hook on the inner side.

H. Abíetis.—Pitch-black, with yellowish pile, elytra with two fasciæ, composed of tufts of yellowish hairs, legs black. 6–8.—*Cur. Abietis, Linn. Cur. Pini, Marsh. Don.* xv. pl. 529. *Rynch. Pini, Leach.*

Obscure pitchy-black; head and rostrum rugosely punctured, with scattered yellowish hairs, the former rather depressed between the eyes, and having a tuft of ochreous hairs on each side; the latter with a narrow carina; antennæ dark pitchy-red, pilose: thorax deeply and somewhat longitudinally rugose-punctate, with an obsolete dorsal carina, and strong yellow hairs, thickest on the sides, where they often form two rounded spots: scutellum clothed with cinereous pubescence: elytra with numerous small patches of strong depressed yellow hairs, forming two spotted fasciæ, one before the middle, abbreviated and placed obliquely, the other behind the middle and nearly transverse; the rest of the spots scattered irregularly; each elytron having ten narrow striæ composed of oblong-quadrate impressions, rugose interstices, and a callosity near the apex: under side of the body and legs pitchy-black, punctured, with thinly scattered rigid hairs; all the thighs with a strong tooth.

Frequents the Scotch fir, and is not unfrequent in this district, as well as throughout Scotland. It extends to the southern extremity of Scotland in tolerable abundance, occurs rather sparingly in Cumberland and the adjoining counties, becoming gradually rarer as we advance, till in the southern parts of England it is found only in a few situations. The imperfect description of this species given by Linné, who appears in some of his works to confound it with another insect, has rendered it difficult to identify his *Cur. Abietis*, and its synonymy is consequently involved in considerable complexity. From an inaccurately named specimen in the Linnean cabinet, Marsham was led to believe that it was the *Cur. Pini* of that illustrious observer, and he accordingly described it under that name in his *Entomologia Britannica*. Neither Paykull nor Fabricius appear to have formed accurate views of its characters, the latter, in his *Species Insectorum*, regarding it as a sexual variety of an insect belonging to a genus considerably dissimilar. The larva inhabits the wood of the Scotch fir, often proving very destructive to young plantations of that tree. The manners of the perfect insect are well described by Linné, in his peculiar style, "Tarde incedit, arcte apprehendit, tenaciter adhæret, ore frustra cutem mordere tentat captivus *."

H. Pinastri, distinguished from the above by its rufous legs, and by its dentate thighs from the genus Pissodes, with which alone it has any chance of being confounded, is said to have been taken in Scotland, there being specimens in the British Museum procured from thence. If placed there, as they probably were, by Dr Leach, it is not unlikely that they were the fruits of some of the numerous entomological excursions in the neighbourhood of Edinburgh, which one of the authors of the present volume had at one time the advantage to make in company with that zealous and accomplished naturalist. Neither his notes, however, nor reminiscences of these excursions, enable him to determine this point. The insect is not unfrequent in Sweden, and an examination of the woods of Braemar, and other extensive pine forests of the north, will likely prove it to be not so rare an inhabitant of Scotland as at present supposed.

GENUS—ÁLOPHUS, *Schoen.* From ἄλοφος, *destitute of a crest.*—Antennæ rather short and thick, inserted towards the apex of the rostrum, 12-jointed, the 1st joint clavate, scarcely reaching to the anterior margin of the eyes, 2d and 3d rather long, obconic, the five following subglobose, the rest forming an oblong-ovate club: rostrum twice the length of the head, somewhat rounded and thickened at the apex, the sides with an oblique groove: body oblong-ovate, apterous: thorax somewhat oblong, convex, rounded on the sides, and slightly lobed behind the eyes: elytra united, oblong-ovate: thighs without teeth, thickened in the middle; tibiæ dilated, truncated at the apex which is destitute of a hook.

A. triguttátus.—Blackish, elytra griseous, marked with three whitish spots, the hinder one large and heart-shaped, placed on the suture towards the apex. 3–3¾.—*Cur. triguttatus. Fab.*

Black, or brownish-black, clothed with hairs and scales, the latter having a metallic lustre: thorax covered with scales and pubescence of a uniform colour, the centre channelled: elytra indistinctly striated, and bearing rows of hairs, of a brownish or griseous colour, with scales on the sides, each having a small round whitish spot before the middle, and a large heart-shaped one common to both elytra posteriorly: under side black, with shining pile; legs pitch-black, the tarsi ferruginous.

This appears to be rather a scarce insect in Scotland, and local in its distribution. It occurs in great plenty at Raehills in Dumfries-shire, confined, however, to a very limited locality. In this neighbourhood, it has been taken at Morningside, Duddingston, and elsewhere.

GENUS—BARYNÓTUS, *Germar.* From βαρὺς, *heavy*, and νῶτος, *the back.*—Antennæ not extending to the base of the thorax, inserted towards the apex of the rostrum, somewhat slender, 12-jointed, 1st joint reaching to the middle of the eyes, 2d and 3d rather long, obconic, 4–8 short, somewhat nodose, scarcely increasing in diameter, the club oblong-ovate, acuminated, 4-jointed: rostrum a little longer than the head, rather flat above, the apex a little thickened: thorax

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* Some remarks on the habits and synonymy of this species, by W. S. Macleay, Esq. will be found in the 1st vol. of the Zoological Journal.

somewhat transverse, truncate before and behind, the sides rounded: elytra subovate, closely united, the shoulders prominent, the suture convex posteriorly, and carinated: legs of equal length; thighs clavate, simple; tibiæ armed with a minute hook at the apex.

B. Mercuriális.—Black, clothed with dusky scales having a coppery lustre, elytra punctate-striate, the suture behind and the alternate interstices elevated, antennæ and tibiæ pitch-red. 2½–3.—*Cur. mercurialis, Fab.*

Subovate, convex, apterous, covered with small hair-like scales of a faint coppery lustre, the surface beneath black and punctate: forehead with a faint impression, and the rostrum with an elevated line down the middle; eyes depressed, brown; antennæ pitchy-red, pilose: thorax widest behind, the sides scarcely dilated, and having an elevated dorsal line: elytra connate, wider than the thorax, and more than twice its length, the basal margin slightly concave, the shoulders prominent, and the suture behind elevated into a sharp carina; indistinctly punctate-striate, some of the interstices, particularly the 5th and 7th from the suture, rather elevated, the scales of a coppery or brassy tint variegated with marks of a darker colour: under side of the body black, squamose; legs piceous, with short hairs.

Not unfrequent in numerous places about Edinburgh.

B. obscúrus.—Pitch-black, variegated with fuscous and ash-coloured scales, rostrum rather glabrous, having a single furrow down the middle, elytra faintly punctate-striate. 4–5.—*Cur. obscurus, Fab. Gyllen. Cur. pilosulus, Marsh.*

Rostrum nearly glabrous, rough with oblong punctures, and having a pretty deep furrow down the middle; antennæ pitchy, somewhat reddish: thorax not very convex, granulated on the sides, the surface punctured anteriorly, and generally with a few scattered scales; the centre obsoletely grooved: elytra a little compressed at the apex, dull black, with round adpressed cinereous scales, and rows of strong hairs, especially towards the apex; faintly punctate-striate, the alternate interstices slightly elevated, and not unfrequently having the scales rubbed off, especially in front; the fifth and seventh striæ slightly arched at the shoulder, and united: under side and legs black, pubescent, the tibiæ and tarsi often more or less ferruginous.

Not scarce under stones. King's Park. Granton. Fields at Duddingston, &c.

B. elevátus.—Pitch-black, covered with scales of a uniform cinereous colour, rostrum scaly, with five grooves, elytra deeply punctate-striate. 4.—*Cur. elevatus, Marsh. Cur. Bohemanni, Gyllen.*

Black, clothed with scales which are of a uniform cinereous colour; rostrum squamous, and having two abbreviated furrows on each side of the central one: elytra rather deeply punctate-striate, the scales cinereous, not variegated by the intermixture of others of a different colour; the fifth and sixth striæ slightly arched, and united before reaching the shoulder, the alternate interstices and the suture behind considerably elevated: antennæ, under side of the body, and legs, nearly as in *B. obscurus*.

Very rare in this neighbourhood, a few specimens only having been obtained from the vicinity of Lasswade. It likewise occurs in Roxburghshire, and near Dumfries, but not plentifully.

GENUS—**LIOPHLÁEUS**, *Germar*. From λειος, *smooth*, and φλοιὸς, *bark or covering*.—Antennæ reaching to the base of the thorax, inserted towards the apex of the rostrum, rather slender, 12-jointed, the radical joint reaching to the anterior margin of the thorax, 2–5 obconic, becoming gradually shorter, 6–8 short, turbinate, the club elongate-ovate, acuminated, 4-jointed: rostrum very little longer than the head, rounded, thickened at the apex: eyes rounded: thorax transverse, the sides very much rounded, the middle transversely convex: elytra large, very convex, the shoulders forming an obtuse angle: legs strong; thighs clavate, armed with a small tooth; tibiæ rounded, dilated, truncate at the apex, which is without a hook.

L. núbilus.—Dull black, densely clothed with cinereous scales, thorax finely coriaceous, and slightly carinated in the middle, elytra punctate-striate, the alternate interstices tessellated with spots of fuscous scales. 4½–5½.—♂ *Cur. subclavatus, Marsh.* ♀ *Cur. floccosus* and *subglobosus, Marsh.*

Body dull black, with a covering of ashy scales; head and rostrum finely coriaceous, having a small impression on the forehead; antennæ pitch-black: thorax thickly and minutely granulated, the scales hair-like and depressed, those on the sides having a faint metallic lustre; the centre with an inconspicuous ridge: elytra large, very convex behind, the apex acuminated, regularly and rather faintly punctate-striate, the interstices coriaceous, the alternate ones with a series of spots composed of dusky scales: under side and legs black, with cinereous pubescence, the thighs armed with a small tooth, which is most observable in the anterior pair.

On plants in woods and shady places, occasional. Banks of the Water of Leith, near St Bernard's Well. Banks of the Esk, near Inveresk Church, on the *Symphytum tuberosum*, Comfrey.

GENUS—**OTIORHÝNCHUS**, *Germar*. Name composed of ὦτίον, a diminutive from οὖς, ὠτὸς, *the ear*, and ῥύγχος, *a beak*, to which a minute projection near the apex of the rostrum bears a faint resemblance.—Antennæ about half the length of the body, inserted towards the apex of the rostrum, 12-jointed, the radical joint reaching to the anterior edge of the thorax, 2d and 3d rather long, obconic, the rest very short, the club oblong, acuminated, very narrow, 4-jointed: rostrum rather short and thick, the apex thickened, and furnished with a divaricating piece on each side, the groove for receiving the basal joint of the antennæ short, and widened towards the eyes: thorax rounded on the sides, convex above: elytra united, ovate or oblong-ovate: thighs clavate.

The members of this genus are handsome insects, very similar to each other in form and habit. They are incapable of flight, in consequence of the junction of the wing-cases, and are usually found in the earth or beneath stones. In adaptation to their mode of life, the covering of their bodies is very hard and tubercular, presenting a surface well fitted to resist the pressure and attrition to which the nature of their haunts continually exposes them. They are of sombre colours, generally black or brown, and doubtless often escape their enemies by the similarity of their hue to the objects which usually surround them. Twenty-one species are described as British; of these the following occur in Scotland:—

O. Ligústici.—Black, clothed with griseous scales, thorax and elytra covered with conical granulations, the latter punctate-striate towards the sides. 6–6½.—*Cur. Ligustici, Linn. Marsh.*

Head and rostrum black, roughly punctured, the latter with a ridge extending from the base beyond the middle, where it is bifid; antennæ pitch-black, pubescent: thorax much rounded on the sides, covered throughout with rounded elevated tubercles, between which is scattered depressed rigid pile, the centre obsoletely marked with an impressed line: scutellum apparently wanting: elytra very large, ovate, convex, covered with granulations, and obscurely striated towards the sides, the surface thickly covered with hair-like greyish scales: under side and legs black, squamous; the thighs with a small tooth near the apex.

This conspicuous insect has been taken in the environs of Edinburgh, but not recently. It is very rare in Scotland, and apparently throughout Britain.

O. sulcátus.—Brownish-black, the elytra furrowed and marked with small scattered tufts of yellowish hairs, the rostrum with a longitudinal furrow. 4¾–5.—*Cur. sulcatus, Fab. Marsh. Gyllen.*

Head and rostrum black, punctulated, and sparingly pubescent, the former with a small frontal impression, the latter with a wide furrow on its upper side; antennæ pitchy: thorax longer than broad, rather widest in the middle, black, covered with regular conical granulations, the tips of which are rounded and somewhat shining, with short pubescence interspersed, the middle obsoletely channelled: elytra twice the breadth of the thorax at the base, slightly convex above, rather deeply furrowed, the bottom of the furrows and the interstices rugosely granulated; of a somewhat shining black colour, with thinly scattered tufts of yellowish or ferruginous hairs: under side and legs black, sparingly pubescent; the thighs with a small inconspicuous tooth.

Rather scarce in Scotland, although plentiful in the south of England. Braid Hill. Road side near Comely Bank.

O. pícipes.—Piceous, thickly covered with rounded cinereous and dusky scales, the elytra with ten rows of ocellated points on each. 3–4½.—*Cur. picipes, Fab. Gyllen. Cur. notatus, Bonsdorf. Steph. Cur. vastator, Marsh.*

Head black, with an oblong impression between the eyes; rostrum not longer than the head, piceous and rugose, with a few scattered cinereous scales: antennæ rather thick, pitchy, pilose: thorax proportionably wider in the middle than in the preceding species, granulated in a similar manner, pitchy, with round cinereous scales, thickly placed on the sides, and an obsolete dorsal channel: scutellum scarcely observable: elytra ovate, dilated a little behind the base, which is scarcely wider than the thorax, piceous, covered with round cinereous and fuscous scales intermixed with short rigid hairs; each with ten rows of ocellated points consisting of a central scale, surrounded by an impressed circle, the spaces between these rows occupied by a regular series of small elevated glabrous tubercles: under side of the body pitchy, pubescent, the sides squamose: legs pitchy-red or ferruginous; the thighs with a very obtuse tooth.

A common species under stones, &c. Frequent in the summer months in shady woods, resting on plants and grasses in the axillæ of the leaves and branches.

O. ovátus.—Black, somewhat shining, antennæ and legs dull ferruginous, thorax subglobose, coarsely wrinkled, the wrinkles disposed somewhat elliptically in the centre. 2–2¾.—*Cur. ovatus, Linn. Marsh.*

Head smooth on the vertex, the anterior part and the rostrum, which is scarcely the length of the head, depressed and rugosely punctured: antennæ half the length of the body, dull ferruginous: thorax very convex above, nearly globose, black, shining, and covered with tubercles, which become confluent on the disk, and form elevated irregular lines, arranged somewhat elliptically round a smooth narrow space in the centre: elytra rather depressed on the back anteriorly, shining-black, coarsely punctate-striate, the interstices somewhat rugose, and adspersed with short cinereous hairs: under side of the body black, punctured; legs dull ferruginous, all the thighs with a strong acute tooth.

Var. b. Pale, antennæ and legs testaceous.—*Cur. pabulinus, Panz. Steph.*

Under stones, decaying wood, &c., rather common. It is sometimes found on plants like the foregoing species. King's Park and places adjacent.

O. tenebricósus.—Black, somewhat shining, elytra attenuated towards the apex and very obsoletely punctate-striate, legs rufous. 4–5½.—*Gyllen. Cur. niger, Marsh. Cur. clavipes, Bons. Cur. maritimus, var.* Don. xv. 63. pl. 533. f. 2.

Oblong-ovate, attenuated behind, shining black, with very fine thinly scattered cinereous pubescence: head and rostrum punctate, the latter dilated at the apex, with an elevated line down the centre, which is forked anteriorly, the margins likewise elevated; the apex emarginate: antennæ long, black, pilose: thorax long, subcylindric, very little dilated in the middle, convex, generally punctate on the disk, the sides minutely granulated: elytra much dilated just behind the base, and attenuated to the apex, which is rounded; convex above, and marked with very obsoletely punctured striæ, which are most perceptible towards the suture and apex: under side of the body black, punctulated and pubescent: legs elongate, rufous, or pitchy, the thighs long, slender at the base, and thickened before the apex.

Rare; near Musselburgh.

O. atro-ápterous.—Black, somewhat shining, elytra ovate, covered with minute granulations, and obsoletely furrowed, legs pitch-red. 3¾–4.—*Cur. atro-apterus, De Geer.*

Head, rostrum, antennæ, and thorax similar to those of the preceding species, but the thorax is more dilated on the sides, and has a transverse depression before and behind; rostrum very slightly emarginate at the apex: elytra a little wider at the base than the thorax, much dilated near the middle, and again narrowed behind, the surface covered with small granulations, obsoletely furrowed, and having fine depressed ash-coloured pile: under side rather dull black, punctured and pubescent: legs elongate, of a pitch-red colour, the thighs very thick towards the apex.

Apparently confined to the sea shore in this neighbourhood, frequenting the sand banks covered with sea reed, above high water mark.—Between Leith and Portobello, and elsewhere along the coast, pretty frequent.

O. laevigátus.—Glossy black, antennæ and legs pitchy, elytra very finely punctate-striate, the rostrum not carinated above. 3½.—*Steph.*

Less than either of the preceding, and of a harder consistence, the body entirely black, shining and glabrous: head minutely punctured; the rostrum short and thick, flat above, rugosely punctured, and not carinated in the middle; antennæ pitch-red: thorax rounded in the middle, very convex, thickly and minutely punctured on the back, the sides finely granulated: elytra slightly attenuated from the middle to the apex, very convex, finely and rather indistinctly punctate-striate, the interstices flat or nearly so, and covered with very small punctures; under side shining black, punctured: legs pitchy, sometimes nearly black.

Occurs on the shores of the Firth, very sparingly. Caroline Park. Cramond. It inhabits several of the highest mountains in Scotland. "Pulled up with a tuft of Luzula arcuata, amongst whose roots it was buried, at the summit of Ben-na-muic-dhue, the elevation of which is 4300 feet."—*H. C. Watson, Esq.*

O. píceus.—Pitch-black, glabrous and shining, the antennæ and legs rufescent, elytra deeply punctate-striate. 1½–1¾.—*Cur. piceus, Marsh.*

The smallest species of the genus in Britain; pitch-black or brownish, pale when immature, glossy, and free from pubescence; rostrum short and thick, having a groove down the middle; antennæ rufescent: thorax short, convex, thickly covered with pretty large punctures: elytra punctate-striate, the interstices flat: under side black, shining; legs ferruginous, the thighs without a tooth beneath.

Of frequent occurrence beneath stones and among moss. Salisbury Craigs. Braid Hills, &c.

O. scabrósus.—Brownish-black, antennæ and legs dull ferruginous, the thighs slightly dentate. 2¾–3.—*Cur. scabrosus, Marsh.*

Head and rostrum brownish-black, the former punctured, nearly smooth behind; antennæ ferruginous, rather obscure: thorax fuscous, thickly covered with small granulations: elytra reddish-brown, coarsely punctate-striate, the interstices wrinkled across, and bearing rows of short rigid hairs: legs ferruginous, the thighs with an indistinct tooth beneath.

Under stones in loose soil, not unfrequent.

O. scábridus.—Pitch-black, elytra deeply punctate-striate, the interstices wrinkled across. 2.—*Steph.*

Generally pitch-black, with a few hairs, especially on the elytra; head closely punctured; antennæ pitch-black, inclining to red: thorax covered with small granulations, the form nearly globose: elytra deeply punctate-striate, the interstices rough with transverse wrinkles, and bearing a few rigid hairs of a griseous colour; legs black, the tibiæ and tarsi more or less piceous.

Of occasional occurrence in the fields around Edinburgh. Near Slateford. Fields at Niddry.

GENUS—THYLÁCITES, *Germar.* From *θύλακος, a sack*, and *εἶδος, resembling.*—Antennæ inserted in the apex of the rostrum, scarcely reaching to the base of the thorax, 12-jointed, basal joint extending to the eyes, 2d and 3d obconic, 4–8 short, nodose, the club 4-jointed, short ovate: rostrum shorter than the head, thick, flat above; the forehead without a longitudinal line: eyes small, rounded, prominent: thorax transverse, suborbicular: elytra short, very convex or subglobose: thighs a little thickened; tibiæ nearly straight, the apex widened and truncate, without spines.

T. geminátus.—Black, densely clothed with fuscous scales, variegated with lines and spots of an ash-colour, elytra with short rigid cinereous hairs behind. 2–3¾.—*Cur. geminatus, Fab. Gyllen. Cur. maritimus, Marsh.*

Head short and broad, with a shallow transverse impression before the eyes; rostrum short and scarcely narrower than the head, both covered with brownish or cinereous scales, intermixed with others of a darker colour, and short rigid hairs; eyes small, round, of a deep brown colour; antennæ obscurely ferruginous, pubescent: thorax short, transverse, the sides rounded, convex above, and clothed like the thorax, frequently with two short arcuate lines at the base, composed of whitish scales: elytra very wide, subglobose, with ten rather faint punctured striæ on each, the sutural striæ approximating towards the base, the next somewhat divergent; entirely covered with brownish scales and short hairs, with rounded patches of white scales, particularly on the sides: under side of the body piceous, with whitish scales; legs obscurely ferruginous, squamose and pubescent.

Confined to the sea coast, where it occurs plentifully along the shores of the Firth, especially on Fisherrow and Musselburgh Links,—very variable in size and colour, and even in sculpture.

SUBGENUS—**STROPHÓSOMUS**, *Billberg*. From *ςτροφὴ, a bending*, and *σῶμα, the body*.—Antennæ rather long and slender, the radical joint extending to the hinder margin of the eyes, 2d and 3d joints rather long, obconic, the rest short, nearly round, the club oblong-ovate, acuminated: rostrum short and wide, separated from the head at the base by a transverse suture, the apex deeply emarginate: eyes globose, very prominent: thorax short and transverse, narrowest in front, the sides a little rounded, the upper side convex: elytra large, ovate, convex.

S. Córyli.—Black, covered with fuscous scales, variegated with others of an ash colour, the basal half of the suture black; antennæ and legs ferruginous, forehead and rostrum with a groove down the middle. 2–2⅓. —*Cur. Coryli*, *Fab.* *Gyllen.*

Body short and obtuse, the ground colour black, the surface covered with fuscous and cinereous scales, except the basal half of the suture, and apex of the rostrum, which are black: rostrum short and scarcely narrower than the head, from which it is distinguished by a cross suture, rugose, and faintly grooved down the middle; eyes small, round and prominent; antennæ ferruginous, with cinereous hairs: thorax roughly punctured, and marked with three obscure longitudinal lines, the scales intermixed with short rigid hairs: scutellum scarcely observable: elytra clothed with fuscous cinereous scales, variegated with lines and spots of whitish scales, and pretty thickly covered with short rigid hairs, the basal half of the suture naked and black; the surface very convex, and marked with regular punctured striæ: legs ferruginous, with cinereous pubescence.

A frequent inhabitant of woods, particularly of those where the hazel occurs. Braid Wood. Cramond. Craigmillar. Rosslyn, &c.

S. squamulátus.—Fuscous, covered with whitish scales and short scattered hairs, antennæ, tibiæ and tarsi, testaceous, elytra finely punctate-striate. 1½–1¾.—*Cur. squamulatus*, *Fab.* *Gyllen.*

Very short and obtuse, nearly globose, entirely covered with whitish or greyish scales, and short scattered hairs of a similar colour: rostrum as wide as the head, from which it is not separated by a transverse suture; eyes small, black and prominent; antennæ pale testaceous, with the club more obscure: thorax very short, scarcely rounded on the sides: elytra nearly globose, the suture slightly elevated posteriorly, finely punctate-striate, the interstices wide and finely coriaceous: under side fuscous, scarcely punctured, clothed like the upper surface; legs pale testaceous, the apex of the thighs fuscous.

In bushy places, and among grass, not very common. Woods at Braid Hermitage. Woods about Lasswade.

S. limbátus.—Black, somewhat shining, the base of the suture and external margin of the elytra clothed with golden or silvery scales. 2–2¼. —*Cur. limbatus, Marsh. Stroph. Sus, Steph.*

Considerably more elongate than either of the foregoing, shining black, with silvery or golden scales, which are generally more or less abraded, excepting on the sides of the elytra, and the base of the suture: head and rostrum punctate, with a longitudinal line, and a transverse impression before the eyes: thorax short, transverse, the sides rounded, punctate, and having a channel in the middle: elytra ovate, the base rather wider than the thorax, punctate-striate, the interstices flat, somewhat punctulated and of equal width; the disk generally shining black, the sides with a broad unequal band of golden scales, the apex, and base of the suture likewise squamose: under side of the body black, scaly; legs and antennæ pitchy black, pubescent.

Plentiful on dry sandy hills around Edinburgh. Arthur's Seat, abundant. Pentland Hills. Calton Hill.

SUBGENUS—SCIÁPHILUS, *Schoen.* From *σκιὰ, a shade*, and *φιλος, a lover.*—Antennæ with the radical joint generally extending beyond the eyes, 2d and 3d joints rather long, obconic, the rest short, nodose, the club oblong-ovate, acuminated: rostrum scarcely the length of the head, and a little narrower, rather flat above, the apex emarginate: eyes small, round, rather prominent: elytra large, oblong-ovate, very convex, especially behind, the apex somewhat acuminated: thighs clavate, dentate.

S. muricátus.—Oblong-ovate, brownish, covered with cinereous scales, antennæ and legs fusco-ferruginous, elytra punctate-striate, the interstices with rows of rigid hairs. 2¼–3.—*Cur. muricatus* and *asperatus, Fab. Cur. setosus, Marsh.*

Entirely covered with brownish or cinereous shining scales, beneath which the surface is black and punctured: head rather large, rostrum very little narrower, and scarcely so long, both covered with brownish scales, the apex of the latter black; eyes dark brown, scarcely prominent; antennæ ferruginous: thorax small, scarcely wider than the head, subcylindric, with the middle slightly convex, clothed like the head, the scales on the sides, and a dorsal line, generally whiter than the rest: elytra oblong-ovate, widest behind the middle, very convex posteriorly, the apex somewhat acuminated, with striæ composed of distinct round punctures, and a row of short rigid hairs in the centre of each interstice: under side of the body densely squamose: legs ferruginous, with whitish hairs, all the thighs with a strong tooth.

In woods and bushy places, not very common. South side of Blackford Hill. Corstorphine woods, &c.

SUBGENUS—BRACHÝSOMUS, *Schoen.* From *βραχυς, short*, and *σωμα, the body.*—Antennæ with the radical joint extending beyond the eyes, 2d and 3d joints rather long, sub-obconic, the rest short, equal, truncated at the apex, club ovate: rostrum very short, flat above, smooth, the groove for the basal joint of the antennæ much curved, deep at the base, and shallow at the apex: eyes rounded, rather depressed: thorax small, short, somewhat rounded on the sides, rather convex above: elytra large, united, subglobose.

B. hirsútulus.—Brownish-black, pubescent, antennæ and legs pale testaceous. 1½–1⅔.—*Cur. hirsutulus, Fab. Gyllen. Marsh.*

Head and rostrum black, punctured, clothed with rigid depressed whitish hairs; forehead not grooved; antennæ pale testaceous red, with dense pile: thorax slightly bisinuated at the base, the sides slightly rounded, the surface punctulated and pilose, the sides, anterior margin, and a narrow obsolete line down the centre, more or less covered with whitish scales: elytra nearly globose, deeply punctate-striate, the interstices, which are flat, sparingly covered with greyish scales and strong erect hairs: under side pitch black, sparingly covered with cinereous scales: legs pale testaceous, pubescent.

This insect has been taken on the sandy Links near Musselburgh, on the Braid Hills, and in a few other places, but it is scarce in all the northern parts of Britain.

GENUS—SITÓNA, *Germar*. From σιτώνης, on account of their occasionally frequenting corn.—Antennæ rather short, not reaching to the base of the thorax, 12-jointed, the 1st joint clavate, reaching to the middle of the eyes, the 2d and 3d longer than the following, and obconic, 4–8 short, nodose, the four last forming an oblong-ovate acuminated club: rostrum short, nearly horizontal, flat above, with a groove down the middle: eyes rather large, generally rounded and moderately prominent: thorax somewhat rounded, a little dilated behind the middle: elytra elongate, rounded at the apex, the shoulders obtusely angulated: thighs thickened in the middle; tibiæ truncate at the apex, without spines; radical joint of the tarsi oblong, 2d trigonate, 3d broad, bilobed, the unguicular one clavate.

S. Úlicis.—Black, with cinereous scales, the sides of the thorax and a line down the middle pale, elytra finely punctate-striate, the interstices variegated with cinereous scales, which form a long patch on the shoulder. 2½–3.—*Steph. Illus.* iv. 133.

Black, squamous, the scales of an ash-colour, having a faint metallic-green lustre on the head and thorax; the former, together with the rostrum, punctured, and grooved down the centre; eyes small, rather depressed; antennæ piceous: thorax rather finely punctured, the sides more rounded than in most of the other species of the genus, the centre with a line of pale-coloured scales, which likewise cover the sides: elytra hispid or covered with strong hairs, indistinctly punctate-striate, the surface variegated with pale or cinereous scales which form a long patch on the shoulder: under side black, pubescent; legs of a similar hue, the tibiæ and tarsi slightly pitchy. Destitute of wings.

On furze and broom, frequent on the Braid Hills and elsewhere.

S. tibiális.—Black, sparingly clothed with coppery scales, thorax very minutely punctured and marked with three pale lines, tibiæ testaceous. 1¾–2.—*Cur. tibialis, Herbst. Gyllen. Cur. chloropus, Marsh.*

The smallest species found in this neighbourhood: black, with scales having a coppery lustre; head and rostrum finely punctured, and grooved down the middle; antennæ deep testaceous, the club obscure: thorax dilated in the middle, having an obsolete transverse impression within the base and apex, covered with minute punctures and a few small cupreous scales, which form three narrow indistinct lines; there is likewise a line of silvery-white scales on the sides of the breast: elytra distinctly punctate-striate, the scales similar to those of the thorax, but more thickly placed: under side likewise scaly: legs pubescent, the thighs usually black, the tibiæ and tarsi pale ferruginous.

Not rare on wall-tops, in fields, &c. Walls near Ravelston, plentiful in warm weather. Braid Hills.

S. limbátus.—Black, somewhat shining, the base of the suture and external margin of the elytra clothed with golden or silvery scales. 2-2¼. —*Cur. limbatus, Marsh. Stroph. Sus, Steph.*

Considerably more elongate than either of the foregoing, shining black, with silvery or golden scales, which are generally more or less abraded, excepting on the sides of the elytra, and the base of the suture: head and rostrum punctate, with a longitudinal line, and a transverse impression before the eyes: thorax short, transverse, the sides rounded, punctate, and having a channel in the middle: elytra ovate, the base rather wider than the thorax, punctate-striate, the interstices flat, somewhat punctulated and of equal width; the disk generally shining black, the sides with a broad unequal band of golden scales, the apex, and base of the suture likewise squamose: under side of the body black, scaly; legs and antennæ pitchy black, pubescent.

Plentiful on dry sandy hills around Edinburgh. Arthur's Seat, abundant. Pentland Hills. Calton Hill.

SUBGENUS—SCIÁPHILUS, *Schoen.* From *σκιὰ, a shade*, and *φιλος, a lover.*—Antennæ with the radical joint generally extending beyond the eyes, 2d and 3d joints rather long, obconic, the rest short, nodose, the club oblong-ovate, acuminated: rostrum scarcely the length of the head, and a little narrower, rather flat above, the apex emarginate: eyes small, round, rather prominent: elytra large, oblong-ovate, very convex, especially behind, the apex somewhat acuminated: thighs clavate, dentate.

S. muricátus.—Oblong-ovate, brownish, covered with cinereous scales, antennæ and legs fusco-ferruginous, elytra punctate-striate, the interstices with rows of rigid hairs. 2¼-3.—*Cur. muricatus* and *asperatus, Fab. Cur. setosus, Marsh.*

Entirely covered with brownish or cinereous shining scales, beneath which the surface is black and punctured: head rather large, rostrum very little narrower, and scarcely so long, both covered with brownish scales, the apex of the latter black; eyes dark brown, scarcely prominent; antennæ ferruginous: thorax small, scarcely wider than the head, subcylindric, with the middle slightly convex, clothed like the head, the scales on the sides, and a dorsal line, generally whiter than the rest: elytra oblong-ovate, widest behind the middle, very convex posteriorly, the apex somewhat acuminated, with striæ composed of distinct round punctures, and a row of short rigid hairs in the centre of each interstice: under side of the body densely squamose: legs ferruginous, with whitish hairs, all the thighs with a strong tooth.

In woods and bushy places, not very common. South side of Blackford Hill. Corstorphine woods, &c.

SUBGENUS—BRACHÝSOMUS, *Schoen.* From *βραχυς, short*, and *σωμα, the body.*—Antennæ with the radical joint extending beyond the eyes, 2d and 3d joints rather long, sub-obconic, the rest short, equal, truncated at the apex, club ovate: rostrum very short, flat above, smooth, the groove for the basal joint of the antennæ much curved, deep at the base, and shallow at the apex: eyes rounded, rather depressed: thorax small, short, somewhat rounded on the sides, rather convex above: elytra large, united, subglobose.

B. hirsútulus.—Brownish-black, pubescent, antennæ and legs pale testaceous. 1½-1⅝.—*Cur. hirsutulus, Fab. Gyllen. Marsh.*

Head and rostrum black, punctured, clothed with rigid depressed whitish hairs; forehead not grooved; antennæ pale testaceous red, with dense pile: thorax slightly bisinuated at the base, the sides slightly rounded, the surface punctulated and pilose, the sides, anterior margin, and a narrow obsolete line down the centre, more or less covered with whitish scales: elytra nearly globose, deeply punctate-striate, the interstices, which are flat, sparingly covered with greyish scales and strong erect hairs: under side pitch black, sparingly covered with cinereous scales: legs pale testaceous, pubescent.

This insect has been taken on the sandy Links near Musselburgh, on the Braid Hills, and in a few other places, but it is scarce in all the northern parts of Britain.

GENUS—SITÓNA, *Germar*. From σιτώνης, on account of their occasionally frequenting corn.—Antennæ rather short, not reaching to the base of the thorax, 12-jointed, the 1st joint clavate, reaching to the middle of the eyes, the 2d and 3d longer than the following, and obconic, 4–8 short, nodose, the four last forming an oblong-ovate acuminated club: rostrum short, nearly horizontal, flat above, with a groove down the middle: eyes rather large, generally rounded and moderately prominent: thorax somewhat rounded, a little dilated behind the middle: elytra elongate, rounded at the apex, the shoulders obtusely angulated: thighs thickened in the middle; tibiæ truncate at the apex, without spines; radical joint of the tarsi oblong, 2d trigonate, 3d broad, bilobed, the unguicular one clavate.

S. Úlicis.—Black, with cinereous scales, the sides of the thorax and a line down the middle pale, elytra finely punctate-striate, the interstices variegated with cinereous scales, which form a long patch on the shoulder. 2½–3.—*Steph. Illus.* iv. 133.

Black, squamous, the scales of an ash-colour, having a faint metallic-green lustre on the head and thorax; the former, together with the rostrum, punctured, and grooved down the centre; eyes small, rather depressed; antennæ piceous: thorax rather finely punctured, the sides more rounded than in most of the other species of the genus, the centre with a line of pale-coloured scales, which likewise cover the sides: elytra hispid or covered with strong hairs, indistinctly punctate-striate, the surface variegated with pale or cinereous scales which form a long patch on the shoulder: under side black, pubescent; legs of a similar hue, the tibiæ and tarsi slightly pitchy. Destitute of wings.

On furze and broom, frequent on the Braid Hills and elsewhere.

S. tibiális.—Black, sparingly clothed with coppery scales, thorax very minutely punctured and marked with three pale lines, tibiæ testaceous. 1¾–2.—*Cur. tibialis, Herbst. Gyllen. Cur. chloropus, Marsh.*

The smallest species found in this neighbourhood: black, with scales having a coppery lustre; head and rostrum finely punctured, and grooved down the middle; antennæ deep testaceous, the club obscure: thorax dilated in the middle, having an obsolete transverse impression within the base and apex, covered with minute punctures and a few small cupreous scales, which form three narrow indistinct lines; there is likewise a line of silvery-white scales on the sides of the breast: elytra distinctly punctate-striate, the scales similar to those of the thorax, but more thickly placed: under side likewise scaly: legs pubescent, the thighs usually black, the tibiæ and tarsi pale ferruginous.

Not rare on wall-tops, in fields, &c. Walls near Ravelston, plentiful in warm weather. Braid Hills.

S. limbátus.—Black, somewhat shining, the base of the suture and external margin of the elytra clothed with golden or silvery scales. 2–2¾. —*Cur. limbatus, Marsh. Stroph. Sus, Steph.*

Considerably more elongate than either of the foregoing, shining black, with silvery or golden scales, which are generally more or less abraded, excepting on the sides of the elytra, and the base of the suture: head and rostrum punctate, with a longitudinal line, and a transverse impression before the eyes: thorax short, transverse, the sides rounded, punctate, and having a channel in the middle: elytra ovate, the base rather wider than the thorax, punctate-striate, the interstices flat, somewhat punctulated and of equal width; the disk generally shining black, the sides with a broad unequal band of golden scales, the apex, and base of the suture likewise squamose: under side of the body black, scaly; legs and antennæ pitchy black, pubescent.

Plentiful on dry sandy hills around Edinburgh. Arthur's Seat, abundant. Pentland Hills. Calton Hill.

SUBGENUS—**SCIÁPHILUS**, *Schoen.* From *σκιὰ, a shade*, and *φιλος, a lover.*—Antennæ with the radical joint generally extending beyond the eyes, 2d and 3d joints rather long, obconic, the rest short, nodose, the club oblong-ovate, acuminated: rostrum scarcely the length of the head, and a little narrower, rather flat above, the apex emarginate: eyes small, round, rather prominent: elytra large, oblong-ovate, very convex, especially behind, the apex somewhat acuminated: thighs clavate, dentate.

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Entirely covered with brownish or cinereous shining scales, beneath which the surface is black and punctured: head rather large, rostrum very little narrower, and scarcely so long, both covered with brownish scales, the apex of the latter black; eyes dark brown, scarcely prominent; antennæ ferruginous: thorax small, scarcely wider than the head, subcylindric, with the middle slightly convex, clothed like the head, the scales on the sides, and a dorsal line, generally whiter than the rest: elytra oblong-ovate, widest behind the middle, very convex posteriorly, the apex somewhat acuminated, with striæ composed of distinct round punctures, and a row of short rigid hairs in the centre of each interstice: under side of the body densely squamose: legs ferruginous, with whitish hairs, all the thighs with a strong tooth.

In woods and bushy places, not very common. South side of Blackford Hill. Corstorphine woods, &c.

SUBGENUS—**BRACHÝSOMUS**, *Schoen.* From *βραχυς; short*, and *σωμα, the body.*—Antennæ with the radical joint extending beyond the eyes, 2d and 3d joints rather long, sub-obconic, the rest short, equal, truncated at the apex, club ovate: rostrum very short, flat above, smooth, the groove for the basal joint of the antennæ much curved, deep at the base, and shallow at the apex: eyes rounded, rather depressed: thorax small, short, somewhat rounded on the sides, rather convex above: elytra large, united, subglobose.

B. hirsútulus.—Brownish-black, pubescent, antennæ and legs pale testaceous. 1½–1⅔.—*Cur. hirsutulus, Fab. Gyllen. Marsh.*

Head and rostrum black, punctured, clothed with rigid depressed whitish hairs; forehead not grooved; antennæ pale testaceous red, with dense pile: thorax slightly bisinuated at the base, the sides slightly rounded, the surface punctulated and pilose, the sides, anterior margin, and a narrow obsolete line down the centre, more or less covered with whitish scales: elytra nearly globose, deeply punctate-striate, the interstices, which are flat, sparingly covered with greyish scales and strong erect hairs: under side pitch black, sparingly covered with cinereous scales: legs pale testaceous, pubescent.

This insect has been taken on the sandy Links near Musselburgh, on the Braid Hills, and in a few other places, but it is scarce in all the northern parts of Britain.

GENUS—SITÓNA, *Germar*. From σιτώνης, on account of their occasionally frequenting corn.—Antennæ rather short, not reaching to the base of the thorax, 12-jointed, the 1st joint clavate, reaching to the middle of the eyes, the 2d and 3d longer than the following, and obconic, 4–8 short, nodose, the four last forming an oblong-ovate acuminated club: rostrum short, nearly horizontal, flat above, with a groove down the middle: eyes rather large, generally rounded and moderately prominent: thorax somewhat rounded, a little dilated behind the middle: elytra elongate, rounded at the apex, the shoulders obtusely angulated: thighs thickened in the middle; tibiæ truncate at the apex, without spines; radical joint of the tarsi oblong, 2d trigonate, 3d broad, bilobed, the unguicular one clavate.

S. Úlicis.—Black, with cinereous scales, the sides of the thorax and a line down the middle pale, elytra finely punctate-striate, the interstices variegated with cinereous scales, which form a long patch on the shoulder. 2½–3.—*Steph. Illus.* iv. 133.

Black, squamous, the scales of an ash-colour, having a faint metallic-green lustre on the head and thorax; the former, together with the rostrum, punctured, and grooved down the centre; eyes small, rather depressed; antennæ piceous: thorax rather finely punctured, the sides more rounded than in most of the other species of the genus, the centre with a line of pale-coloured scales, which likewise cover the sides: elytra hispid or covered with strong hairs, indistinctly punctate-striate, the surface variegated with pale or cinereous scales which form a long patch on the shoulder: under side black, pubescent; legs of a similar hue, the tibiæ and tarsi slightly pitchy. Destitute of wings.

On furze and broom, frequent on the Braid Hills and elsewhere.

S. tibiális.—Black, sparingly clothed with coppery scales, thorax very minutely punctured and marked with three pale lines, tibiæ testaceous. 1¾–2.—*Cur. tibialis, Herbst. Gyllen. Cur. chloropus, Marsh.*

The smallest species found in this neighbourhood: black, with scales having a coppery lustre; head and rostrum finely punctured, and grooved down the middle; antennæ deep testaceous, the club obscure: thorax dilated in the middle, having an obsolete transverse impression within the base and apex, covered with minute punctures and a few small cupreous scales, which form three narrow indistinct lines; there is likewise a line of silvery-white scales on the sides of the breast: elytra distinctly punctate-striate, the scales similar to those of the thorax, but more thickly placed: under side likewise scaly: legs pubescent, the thighs usually black, the tibiæ and tarsi pale ferruginous.

Not rare on wall-tops, in fields, &c. Walls near Ravelston, plentiful in warm weather. Braid Hills.

S. hispídula.—Black with fuscous scales, thorax deeply punctured, the elytra variegated with cinereous, and having a row of whitish hairs on each interstice. 2.—*Cur. hispidulus*, *Fab.* *Marsh.* *Gyllen.*

Head and rostrum black, squamose, with short rigid hairs, the latter flat above and canaliculate: antennæ obscurely ferruginous, the club dark; eyes small, rather depressed: thorax slightly rounded in the middle, deeply and rather thinly punctured, with minute fuscous scales, and three cinereous lines, the central one narrow: elytra with fuscous and ashy scales, punctate-striate, each interstice with a series of short rigid hairs of a white colour: under side of the body densely squamose, paler than the upper surface: thighs pitchy, squamose, tibiæ and tarsi testaceous. Furnished with wings.

Not unfrequent throughout this district, and likewise further to the south.

S. lineátus.—Black, covered with fuscous scales above and cinereous scales beneath, the thorax and elytra with white lines; antennæ, tibiæ, and tarsi ferruginous. 2¼–2½.—*Cur. lineatus*, *Linn.* *Marsh.* *Don.* xi. pl. 389. f. 2.

Head and rostrum finely punctured and wholly covered with small hair-like scales of a brown colour, having a faint coppery lustre in certain lights, the forehead impressed with a narrow line extending beyond the middle of the rostrum; antennæ rufescent: thorax dilated rather behind the middle, transversely impressed at front, which has the margin slightly elevated, the surface punctulated, with a few dusky cinereous scales and three whitish lines: elytra punctate-striate, the interstices flat and coriaceous, the alternate ones, together with a short line at the base of the suture, and another near the shoulder, whitish: under side covered with scales and hairs of an ash-colour, having a slightly silvery lustre; legs ferruginous, the thighs black.

In considerable abundance in many situations near Edinburgh.

S. canína.—Black, thickly covered with fuscous scales, thorax rather long, minutely punctured, and marked with three indistinct lines, base of the antennæ and tibiæ ferruginous. 2–2¼.—*Cur. canina*, *Fab.* *Gyllen.*

Head and rostrum nearly as in the preceding; antennæ ferruginous, the club obscure: thorax somewhat elongate, the middle very slightly dilated, black, punctulated, having a narrow brownish line down the middle, and a broad one on each side, the disk with four yellowish-brown spots, often very indistinct, between the lines; the scales on the under side whitish: elytra regularly punctate-striate, covered with dusky-testaceous scales, beneath which the surface is black and coriaceous, the alternate interstices sometimes adorned with rows of pale spots; under side with shining ash-coloured scales; legs ferruginous, the thighs black.

Not rare in many parts of the south of Scotland. In this neighbourhood we have observed it near Portobello and at Loanhead.

Scotland appears to supply a large proportion of the species of this genus. Mr Stephens indicates the four following as inhabiting Dumfries-shire, and we have observed the others in the situations mentioned. S. grisea, S. puncticollis, S. humeralis, S. crinita. S. subaurata, Roxburghshire, near Hawick. S. Spartii, not rare in many of the northern counties, Aberdeen, Argyll. S. fusca, " Forfarshire," *Steph. Illus.*

GENUS—POLYDRÚSUS, *Germar.* From πολυδροσος, in reference to the scaly covering of the body.—Antennæ the length of the head and thorax, inserted below the middle of the rostrum, 12-jointed, 1st joint slightly bent, reaching generally beyond the eyes, 2d and 3d rather long, obconic, 4–8 short, usually somewhat obconic, club elongate, oval, acuminate, 4-jointed: rostrum a little shorter and narrower than the head, nutant, emarginate at the apex, the grooves for the antennæ narrow, bent, and meeting in the middle of the rostrum beneath: thorax small and short: elytra convex, especially behind, the apex slightly acuminated, the shoulders obtusely angulated: thighs thickened in the middle; tibiæ subcompressed, the apex without spines; tarsi spongy beneath.

The insects of this and the following genera frequent the foliage of trees and herbaceous plants. They excel most of the indigenous Curculionidæ in brilliancy of colouring, which is produced by a covering of minute scales, the body itself being dull and opaque. These scales vary in shape, being often rounded and adpressed to the surface, at other times narrower and having the appearance of hair. The prevailing colours are green or silvery-green, golden, and coppery, of various shades and resplendency, most of the species having a considerable range of variation; the former colour, however, is the most common, and is intended, there can be no doubt, to contribute to the preservation of the individual, by assimilating it to the objects with which it is usually surrounded. The beauty of the British species, though far from inconsiderable, is not so striking owing to the smallness of their size, as in a foreign group, allied in structure and still more in habit (*Entimides*, Schoen.) which may be cited as exhibiting some of the most richly adorned examples of insect life. The *Entimus imperialis*, a native of Brazil, has been long known in Britain as the Diamond Beetle, a name bestowed on it in consequence of the metallic splendour of its green and golden scales, which make the surface appear as if powdered with minute crystals of emerald.

P. cervínus.—Black, covered with rounded shining cinereous scales, the elytra with several rows of naked dusky black spots on the back. 2–2¾.—*Cur. cervinus, Linn.*

Variable in size and colour; the scales rounded, most commonly ash-colour with a silvery lustre, not unfrequently coppery or pale yellow, and sometimes greenish: rostrum considerably shorter and narrower than the head, the surface of both ruggedly punctulated and scaly; antennæ pale testaceous at the base, blackish towards the tip: thorax small, a little narrowest in front, thickly and ruggedly punctate, with a line on each side and a narrow one in the middle formed of dense scales: elytra ample, punctate-striate, the interstices towards the suture with a row of unequal naked dusky black spots, the rest of the surface scaly: under side with shining cinereous scales: legs slender, black, pubescent; tarsi ferruginous; the thighs with a small tooth beneath.

On trees and shrubs, not very common.

P. mícans.—Black, covered with narrow fulgid scales, antennæ short and rufous, the legs of the same colour, the hinder thighs subdentate. 3¼–4.—*Cur. micans, Fab. Gyllen. Cur. Pyri, Linn. Faun. Suec. Marsh. Don.* iv. pl. 121.

Black, the whole body clothed with narrow hair-like scales generally fulgid or of a reddish-gold colour, at other times greenish-cinereous and more obscure: head and rostrum thickly punctate; the eyes rather prominent; antennæ scarcely so long as the head and thorax, testaceous with the club obscure: thorax short and narrow, the sides slightly rounded: elytra about twice the breadth of the thorax at the base, the shoulders somewhat prominent, much dilated posteriorly, where they are very convex, the apex slightly acuminated; each with ten distinct and regular crenate striæ, the interstices smooth and covered with rather broader scales than the thorax, beneath which the surface is black or pitchy red: under side of the body likewise scaly; legs testaceous-red, the thighs subclavate, the hinder pair with a small tooth.

Found occasionally on trees during the summer months. Elms in the Meadows. Braid Wood. Woods at Dalkeith and Rosslyn.

P. undátus.—Black, covered with somewhat silvery scales, the elytra with three waved fasciæ of fuscous scales, antennæ and legs rufous. 2–2½.—*Fab. Cur. seleneus, Marsh. Cur. tereticollis, De Geer.*

Head and rostrum black, punctate, with cinereous scales; antennæ rather long and slender, rufous: thorax scarcely wider than the head, nearly cylindric, black and punctured like the head, the sides thickly covered with scales of a somewhat silvery hue, the disk more obscure: elytra rather long and convex posteriorly, the apex acuminated; punctate-striate and squamose, the sides and apex somewhat silvery, the disk obscurely cinereous, and having three waved fasciæ of a deep fuscous-colour, which are sometimes obsolete: under side of the body black and scaly, the apex of the abdomen occasionally rufescent; legs rufous, the thighs without teeth.

Frequents the leaves of various trees, particularly those of the birch and hazel, but is scarce. We have observed it in hazel coppices in several parts of Roxburghshire, and it has likewise been taken in Dumfriesshire.

P. oblóngus.—Brownish-black with long cinereous pubescence, antennæ and legs rufous, elytra pale ferruginous, the external margins black. 2¼–2¾.—*Cur. oblongus, Linn. Marsh. Gyllen. Nemoicus oblongus, Steph. Illus.*

Narrow and elongate, covered with ash-coloured hairs, without scales: head punctured; rostrum shorter and narrower than the head, and punctured in a similar manner; eyes large and prominent, dusky black; antennæ pale testaceous, the club deeper: thorax small, rather elongate, narrowed in front, with an impression across the front and base, brownish-black, punctured, and pubescent: scutellum dusky black: elytra about one-half wider than the thorax, the shoulders prominent; ferruginous, or testaceous, rather deeply and remotely punctate-striate, and thinly covered with long hairs; the external margins dusky black: under side blackish, pubescent: legs ferruginous, often pale, the thighs furnished with a strong acute tooth.

On trees and bushes, and sometimes on herbaceous plants, plentiful. Braid Hermitage. Woods at Duddingston. Corstorphine, &c.

GENUS—PHYLLÓBIUS, *Schoenherr.* From φυλλος, *a leaf,* and βιος, *life.*—Antennæ extending beyond the base of the thorax, inserted towards the apex of the rostrum, 12-jointed, the radical joint usually touching the interior margin of the thorax, thickened at the apex and a little bent, 2d and 3d rather long, obconic, 4–8 short, obconic or nodose, equal, the club elongate, narrow or somewhat ovate, acuminated, 4-jointed: rostrum rather narrower than the head, and equal to it in length, nearly horizontal, somewhat thickened at the apex, which is deeply emarginate; the groove short and deep: thorax small, slightly coarctate in front, rounded on the sides, the middle transversely convex; elytra oblong, wider than the thorax, the apex somewhat rounded: thighs thick; tibiæ rounded, without spines at the apex; tarsi spongy beneath, the penultimate joint bilobed, unguicular clavate.

A. *Thighs armed with a strong tooth.*

P. Pýri.—Black, clothed with narrow silken-green or golden scales, antennæ and legs rufo-ferruginous. 3½–4¾.—*Cur. Pyri, Linn. Gyllen. Cur. cæsius, Marsh.*

Clothed with hair-like scales of a golden or silken-green colour, beneath which the surface is dull black; rostrum the length of the head, depressed between the antennæ; the latter rufo-ferruginous, the apex sometimes obscure: thorax small, narrow, the scales adpressed and generally lying transversely: elytra large, punctate-striate, the interstices slightly convex at the base, flat towards the apex, finely coriaceous, and covered with short scales; the sutural and external margins towards their apex fringed with hairs: under side of the body black, with scales like those of the upper surface, the apex of the abdomen frequently piceous; legs long, rufo-ferruginous, the tarsi sometimes obscure, all the thighs clavate, and armed with a strong tooth beneath.

Frequents the foliage of trees, and is rather common. Woods at Cramond. Woods by the sides of the Esk, plentiful above Dalkeith. It seems generally diffused over all the south of Scotland.

P. Alnéti.—Black, covered with narrow scales of a bluish-green colour, antennæ and legs black. 3½–4½.—*Cur. Alneti, Fab. Cur. Cnides, Marsh.*

Head with a carina between the eyes, rather more distinct than in the preceding species; antennæ black or piceous: thorax and elytra densely clothed with narrow hair-like scales, usually of a bluish- or greenish-blue colour, occasionally with a faint golden tint; the elytra punctate-striate, and coriaceous beneath the scales: under side of the body and legs black, with scales the colour of those on the upper surface; the thighs incrassated, and having a strong acute tooth near the apex.

Not nearly so common in this neighbourhood as *P. Pyri*, but found occasionally on trees, shrubs, and herbaceous plants. On trees by the side of the Water of Leith to the west of Edinburgh. Cramond. Banks of the Esk, and woods about Dalkeith.

P. argentátus.—Black, clothed with silvery green rounded scales interspersed with erect hairs, antennæ, tibiæ and tarsi, yellowish. 2¼–3. —*Cur. argentatus, Linn. Marsh. Don.* iii. pl. 107. *Cur. Urticæ, De Geer.*

Distinguished from the two preceding species by the scales with which the whole body is densely clothed being rounded, and interspersed with short erect hairs; the scales very brilliant, and variable in colour, generally yellowish or silvery green, sometimes blue-green, occasionally pale golden-yellow; antennæ long, and rather thick, pale testaceous or yellowish, the basal joint bent: thorax transverse, impressed before and behind, rather convex in the middle: elytra not twice the breadth of the thorax, rather finely punctate-striate, the interstices flat: under side of the body clothed like the upper surface; legs pale yellowish, more or less squamose, the thighs, which are sometimes black, clavate, and armed with a strong acute tooth.

Frequent on the oak and hazel from May to August. Rosslyn. Cramond. Braid Wood, &c.

P. Máli.—Black, with narrow golden or coppery scales, antennæ and legs testaceous, scutellum white. 3–3½.—*Cur. Mali, Fab. Marsh. Gyllen.*

Oblong, black, covered with narrow greyish scales, changing with the light into coppery or fiery red, sometimes greyish or greenish with little metallic lustre; head depressed in front, the rostrum obsoletely channelled, both rugosely punctate, and squamose; antennæ long and rather thick, rufo-testaceous, the club, and sometimes the apex of the basal joint, fuscous: thorax rugosely punctate, and clothed like the head: scutellum conspicuous, covered with white scales: elytra not twice the breadth of the thorax, moderately convex, punctate-striate, somewhat shining black, scarcely coriaceous, the scales not so thickly placed as in the preceding species: under side of the body black, with metallic scales: legs dull testaceous-red, the thighs, which are sometimes pitchy at the apex, with an acute tooth beneath.

On nettles, and plants in woods, rather common in all parts of Scotland.

B. *Thighs without a tooth beneath.*

P. unifórmis.—Black, very thickly covered with rounded rather dull green scales, tibiæ, tarsi and antennæ testaceous, the latter rather thick. 2.—*Cur. unifórmis, Marsh.*

The body entirely covered with rounded scales, which are green, and not very shining, with few or no interspersed hairs: rostrum shorter and narrower than the head; antennæ rather short and thick, pubescent, and entirely of a testaceous colour: thorax transverse, narrowed in front, rather convex posteriorly: elytra punctate-striate, the interstices flat and smooth beneath the scales with which they are closely covered: under side of the thorax and breast with green scales, the abdomen black, with thinly scattered greenish hairs: thighs pitchy-black, squamose, without a tooth on the under side; tibiæ and tarsi testaceous.

Found on the nettle, occurring in great profusion in many places in the vicinity. King's Park, and elsewhere.

P. viridicóllis.—Shining black, the breast, sides of the thorax and scutellum, covered with bright green scales. 2–2½.—*Cur. viridicollis, Fab. Gyllen.*

Head and rostrum roughly punctate, and thinly covered with narrow cinereous or greenish scales, the former wide, the latter a little narrower; antennæ about the length of the head and thorax, rather thick, dull ferruginous: thorax rather convex, the disk thickly punctured, the sides and under surface densely clothed with narrow shining green scales: scutellum likewise covered with green scales: elytra black or brownish-black, nearly glabrous and shining, deeply punctate-striate, with thinly scattered short hairs towards the apex, where the sutural margin is fringed with green hairs: breast thickly covered with green scales, which nearly disappear on the abdomen: thighs without a tooth, black, and scaly; tibiæ and tarsi dark ferruginous.

Found in great profusion in this neighbourhood during the summer months, frequenting herbaceous plants, particularly the Nettle (*Urtica dioica*). In some seasons many dozens of specimens have been observed on every tuft of this plant, at the base of Salisbury Craigs, in the months of June, July and August. It occurs pretty copiously in Sweden, and other northern countries, but becomes very scarce a little to the south, being considered rare in England, where it has hitherto been noticed *only or chiefly in* the more northern counties.

P. maculicornis and *P. parvulus* are Scottish species, the former having occurred near Inverness, and the latter in Roxburgh-shire.

GENUS—CLÉONUS, *Schoenherr.* Derivation of the generic term doubtful; probably either from κλεωνία, the name of a plant, or from κλέος, *glory.*—Antennæ rather short, scarcely reaching to the middle of the thorax, inserted near the middle of the rostrum, 12 jointed, the radical joint not reaching to the eyes, 2d rather longer than any of the following, somewhat obconic, 3–7 short, transverse, 8th much thicker, the club somewhat oblong-ovate, the joints closely united: rostrum rather short and thick, generally grooved above: eyes oblong, depressed: thorax somewhat conical, the front slightly, and the base obviously bisinuated: elytra elongate, with a callosity near the apex: thighs without teeth, the anterior pair thickest; tibiæ widened at the apex, and armed on the inner side with a horizontal hook.

C. sulciróstris.—Black, clothed with short ash-coloured hairs, the rostrum with three longitudinal furrows of nearly equal width and length. 7–9.—*Cur. sulcirostris, Linn. Marsh. Don.* xv. pl. 509. f. 1.

One of the largest of our indigenous *Curculionidæ:* black, rugose, entirely covered with short cinereous hairs: rostrum more than twice the length of the head, thick, punctured, having three deep longitudinal furrows above filled with whitish hairs; antennæ the colour of the head: thorax widest behind, where it is slightly bisinuated, rather contracted a little before the middle; the disk slightly convex, and roughly granulated, having a longitudinal villose furrow, with a small glabrous carina rising in its centre, and two waved indistinct lines formed of whitish pubescence on each side: elytra long, rather wider than the thorax, the internal angles at the base rounded, the apex obtuse; moderately convex above, transversely granulated, with very obscure striæ; the surface thickly clothed with cinereous pubescence, except two linear spaces on each elytron diverging obliquely forward from the suture, and a callosity towards the apex, which are somewhat glabrous: under side of the body and legs black, with ashy hairs; the hinder thighs longer and more slender than the rest; the tarsi brown.

Usually frequents dry gravelly and sandy places, occurring but seldom. Old sandstone quarry on the shore east of Joppa. Figget Whins, to the west of Portobello.

SUBGENUS—BOTHYNÓDERES, *Schoen.*—Antennæ rather short, the radical joint reaching nearly to the eyes, 2d short, rather thick, 3d one-half longer than the 2d, and somewhat obconic, the remainder to the 7th short and transverse, 7th much thickened, the rest forming a fusiform club: rostrum longer than the head, slightly arched, and somewhat narrowed towards the apex, which is slightly truncate and a little emarginate, carinated above: eyes ovate: tarsi elongate.

B. álbidus.—Elytra with a fascia and four spots nearly naked and blackish, the rest covered with white pubescence, rostrum with two furrows. 5–5¾.—*Cur. albidus, Fab. Panz. Gyllen.*

Black, clothed with short pubescence, which is of a fulvous colour on the head, generally tinged with brown on the thorax, and of a pure white on the elytra: rostrum with a furrow on each side, the space between rather elevated and bifid in front, the forehead rugosely punctured anteriorly; antennæ ferruginous at the base, the rest black and pubescent: thorax deeply and ruggedly punctured, with a very faint channel down the middle, which is deeply impressed behind; the sides with whitish pubescence: elytra slightly acuminated at the apex, convex above, punctate-striate, having a sinuated fascia in the middle, a large spot on each shoulder, and a smaller one towards the apex, nearly free from the snow-white pubescence with which the rest of the surface is covered: under side and legs with dense whitish or fulvescent pubescence; the thighs encircled near the apex by a ring of snow-white hairs.

Inhabits dry sandy places, very rare. "Portobello, near Edinburgh," *Dr Leach, Steph. Illus.* This is the only Scottish locality which has come to our knowledge.

GENUS—ÁPION, *Herbst.* Name from *ἄπιον, a pear*, to which the insects of this genus bear a considerable resemblance in shape.—Antennæ straight, 11-jointed, the basal joint longest, clavate, 2d somewhat obconic, the six following short, conic or turbinate, the remaining three forming a club more or less fusiform (Pl. II. fig. 3.): rostrum projecting forwards, rather slender, elongate, subcylindric, slightly curved: thorax conic or subcylindrical, truncated before and behind: elytra ovate, convex: legs rather long, and without spines: tarsi elongate, spongy beneath, 4-jointed, the 3d joint bilobed.—*Curtis, B. E.* v. 211.

The above defined genus was constituted by Herbst, in his *Natursystem.* The species of which it is composed were arranged by Fabricius, Latreille, and others in the genus *Attelabus;* and in Marsham's Entom. Brit. they form the second section of the first division of *Curculio.* "There are certain tribes of insects," Mr Kirby observes, "the species of which are so slightly marked by any apparent difference of size, shape, or colour, that, for want of sufficient examination many are set aside as mere varieties, which, when they are minutely inspected, exhibit characters very strong and discriminative. Amongst these, there are none more liable to be confounded, or that occasion more trouble to the entomologist who wishes to be acquainted with them, than those minute Weevils separated from *Curculio* under the name of *Apion.*" This distinguished entomologist has removed much of the difficulty he alludes to, by an admirable monograph of the genus in the 9th vol. of the Linnean Transactions, to which we are indebted for the greater part of the subsequent descriptions. The genus is very extensive, and about ninety different kinds inhabit Britain. They are all very minute insects, the largest not exceeding 2½ lines. The form of their body is rather handsome, being very narrow in front, and widening gradually to the hinder extremity of the elytra, and in general considerably arched lengthwise. They are covered with a very hard crust, which is not unfrequently adorned with rather vivid metallic tints, and sculptured with deep furrows and catenulated lines. They are strictly herbivorous, and one of the most remarkable circumstances in their history is the invariable adherence of many of the species to a particular kind of plant. By far the greatest proportion are attached to herbaceous diadelphous plants, next to which the *Malvaceæ* and other *Columniferæ* are their favourite food. Some plants support several different kinds of *Apion*, while others form the exclusive resort of a single species, and are never deserted for others kinds, even of the closest natural affinity. The perfect insect feeds on the leaves, but the larva, which has a soft, annulated body, furnished with three tubercles on each side near the head, by which its motions are effected, attacks the seeds of plants, generally of that kind which it continues to frequent in the declared or perfect form.

A. *Rostrum short, cylindrical.*

a. *Antennæ inserted near the middle of the rostrum.*

A. Rúmicis—Black, nearly glabrous, somewhat shining, elytra obovate, obtuse, deeply punctate-striate, and tinged with violet, rostrum rather short. 1¼.—*Kirby.*

Black, rather shining: rostrum short, and rather thick, shining at the apex, punctured at the base; antennæ rather long, inserted at the middle of the rostrum, the club thickened: head and thorax punctate, the latter deeply, with a short central line behind: elytra very convex and obtuse behind, deeply punctate-striate, the interstices rather flat: body beneath and legs black.

On the different species of the genus *Rumex* or Dock, but not very common. Craiglockhart and Braid Hills.

A. Spártii.—Black, glabrous, elytra obovate, blue black, forehead punctured, rostrum of moderate length. 1.—*Kirby.*

Body black, smooth and somewhat shining; head rather wide, marked with confluent punctures between the eyes; rostrum of moderate length, filiform, somewhat shining and punctured throughout; antennæ of moderate length, inserted at the middle of the rostrum: thorax scarcely wider than the head, somewhat cylindric, faintly but distinctly punctured, impressed with a larger puncture before the scutellum; the latter very minute: elytra obovate, somewhat gibbous behind, with punctured striæ, the spaces between which are a little convex.

Seemingly rare; individuals have occurred on the banks of the Water of Leith near Saughtonhall, and at Dalmeny.

A. ténue.—Deep black, narrow, nearly glabrous, and somewhat shining, elytra oblong, rostrum of moderate length and thickness. 1.—*Kirby.*

Small and narrow, of a deep black colour, slightly shining, and bearing fine short pile the colour of the body; head somewhat shorter than the thorax, covered with confluent punctures; rostrum of moderate length, shining; antennæ rather long, inserted near the middle of the rostrum: thorax cylindric, scarcely wider than the head, punctured, and having a large impressed point in the middle behind: elytra oblong, striated, the striæ finely punctured, the interstices rather flat: under side and legs black.

This insect, which is rare in most places, has been taken at Loanhead and Cramond.

A. violáceum.—Black, glabrous, thorax with a large puncture before the scutellum, elytra oblong-obovate, violaceous, rostrum short, and rather thick. 1¾.—*Kirby, Linn. Trans.* ix. pl. 1. f. 16. *Gyllen.*

Body black, shining and glabrous: head somewhat shorter and narrower than the thorax, wrinkled between the eyes with confluent punctures, the centre having an obsolete channel; rostrum short and thick, punctured, smooth and shining; antennæ inserted towards the base, rather long, the club very thick: thorax nearly cylindrical, closely and minutely punctured, with a large puncture in front of the scutellum: elytra elongate, oblong-obovate, beautiful violet-blue, with dark pubescence, and marked with deep punctured striæ: under side and legs black.

Frequents Docks and grassy places, but is not common. We have seen it in great abundance in the central parts of Roxburgh-shire, and towards the southern border of Scotland.

A. Hydrolápathi.—Black, glabrous, thorax with a dorsal line, elytra oblong-obovate, blue or greenish, rostrum short and rather thick. 1⅓–1⅔.—*Kirby, Linn. Trans.* ix. pl. 1. f. 17. *Germ. Mag.* t. iii. f. 14. *Gyllen. Cur. Hydrolapathi, Marsh.*

Black, shining, glabrous; head nearly of the same length and breadth as the thorax, punctate, with striæ composed of confluent punctures between the eyes; rostrum short, not longer than the head, thickly punctulated, rather flat above, the antennæ, which are rather long and have a thickened club, inserted rather behind its middle: thorax nearly cylindric, closely punctate, with a dorsal line, most deeply impressed behind: elytra oblong-obovate, blue in the male, and green in the female, somewhat shining, punctate-striate, the interstices flattish: under side and legs black, the former punctulated.

Found on various kinds of Docks, but is not common in Scotland.

A. Málvæ.—Black, with cinereous pubescence, elytra, antennæ, and legs, testaceous. 1.—*Kirby, Linn. Trans.* ix. pl. 1. f. 2. *Germ. Mag.* pl. iii. f. 19. *Cur. Malvæ, Marsh.*

Body black, hoary with whitish decumbent hairs: rostrum short, rather thick, villose, the apex glabrous; antennæ long, inserted behind the middle of the rostrum, testaceous, the club rather large: thorax widest behind: elytra oblong, testaceous, striated, the striæ nearly free from punctures, with an oblique dusky mark internally at the base of each: legs testaceous, coxæ black.

On the common mallow *(Malva sylvestris)*. Although the plant is very abundant in this neighbourhood, the insect appears to be rather scarce. It is very plentiful in most parts of England.

A. haematódes.—Dull rufous, eyes black, rostrum very short, thorax without an impressed line behind. 1¼–1½.—*Kirby. Germ. Mag.* ii. pl. iv. f. 25.

Body entirely rufous, with short and very thinly scattered pubescence: head nearly the length of the thorax, punctured; rostrum very short, rather thick, punctulate, shining at the apex; antennæ rather longer than the rostrum, inserted near the middle; eyes large, black, prominent: thorax nearly cylindrical, punctured, without a dorsal impression: elytra oblong, punctate-striate, the interstices narrow and convex: body beneath with a short pubescence.

Found among grass at Figget Whins. Not common.

A. frumentárium.—Red, eyes black, thorax subglobose, with a longitudinal groove behind. 2½.—*Kirby. Cur. frumentarius, Linn. Marsh. Cur. sanguineus, De Geer.*

Body bright blood-red (approaching to vermilion) with very fine pubescence: head scarcely shorter than the thorax, punctured; rostrum short and thick, punctured at the base, smooth and shining at the apex; antennæ long, inserted behind the middle of the rostrum, the joints of the club rather distinct; eyes black, prominent: thorax subglobose, margined in front, thickly punctured and having a channel behind: elytra rather long, oblong-ovate, punctate-striate, the convex interstices scarcely wider than the deeply impressed striæ.

On the broad-leaved docks and among grass, occasional throughout Scotland.

b. *Antennæ inserted towards the base of the rostrum.*

A. Radíolus.—Black, glabrous, elytra ovate acute, dark brassy or bluish, rostrum moderate, the antennæ inserted near its base. 1¾.—*Kirby. Germ. Mag.* ii. pl. ii. f. 13.

Rostrum rather long, curved, slightly thickened at the apex, punctulated and shining, the antennæ, which are rather long and robust, inserted very near the base: head with longitudinal wrinkles between the eyes: thorax punctate, with an oblong excavation before the scutellum: elytra widest near the middle, tapering to the apex, where they are somewhat acute; of a brassy-bluish or green colour, and slightly pilose, the striæ obscurely punctured, the sixth rather abbreviated at the shoulder which is somewhat prominent; the interstices slightly convex: body beneath thickly punctate, legs pilose.

On the Mallow, not rare. Salisbury Craigs, &c.

A. aéneum.—Black, glabrous, elytra ovate acute, brassy, bluish or green, forehead with a furrow between the eyes. 2.—*Kirby. Germ. Mag.* ii. pl. iii. f. 8.

Head and thorax black, slightly tinted with brassy: rostrum rather short and thick, closely punctulated, and tumid on each side at the base of the antennæ; the latter inserted behind the middle; head very smooth behind, punctulated between the eyes, where there is a deep furrow: thorax punctured, with a short deeply impressed line behind: elytra shining brassy or bluish, sometimes green, very slightly pubescent, with nine impunctate striæ on each, the 1st, 2d, and 9th generally united at the apex and bounding the rest; the interstices flat; body beneath punctulated, legs with short adpressed hairs.

This conspicuous species is not unfrequent on the Mallow. Salisbury Craigs, plentiful. Road sides about Musselburgh, &c.

B. *Rostrum rather elongate; antennæ inserted near the middle.*

A. Písi.—Black, hoary with whitish pile, elytra globose, sulcate, thorax with a dorsal channel. 1¾.—*A. striatum, Kirby, Linn. Trans.* ix. pl. i. f. 10. *Cur. striatus, Marsh.*

Head rather wide, rugosely punctate between the eyes: rostrum moderate, somewhat shining, slightly punctulated; the antennæ inserted behind its middle: thorax much narrower than the elytra, punctulate and channelled; the elytra globose, deeply sulcate, the sulci punctate; body beneath and legs black with short whitish pile.

Found on broom, not very scarce in this quarter, although accounted rather rare elsewhere. Braid Hills. Pentland Hills, &c.

A. immúne.—Black, hoary with whitish pile, elytra globose, somewhat wedge-shaped, sulcate. 1–1½.—*Kirby.*

Smaller than the preceding; head striated between the eyes; rostrum moderate, punctulated, shining, the antennæ inserted behind the middle: thorax somewhat convex, closely punctulated, the punctures occasionally confluent, with a larger one behind in the centre: elytra globose, wedge-shaped, the apex very obtuse, punctate-sulcate, the interstices moderately convex.

Inhabits broom and furze, not of frequent occurrence.

A. vírens.—Black, elytra oblong-ovate, blue or greenish, striated, the sutural stria deepest, thorax rather smooth. 1¼–1½.—*Kirby. Germ. Mag.* ii. pl. ii. f. 2.

Body black, rather glabrous and shining: head obsoletely punctate, wrinkled between the eyes, black, sometimes slightly tinged with brassy;

rostrum moderate, shining, the antennæ inserted behind its middle: thorax black, or with a brassy tinge, very inconspicuously punctulated, having a large dorsal puncture opposite the scutellum: elytra oblong-ovate, blue, punctate-sulcate, the sutural sulcus deeper than the rest, the interstices somewhat convex.

In hedges and grassy places, not common. We have found it at Duddingston and near Craigleith.

A. márchicum.—Black, elytra oblong-ovate, dark blue, striated, the sutural stria deepest, rostrum short, rather thickened. 1¼.—*Kirby. Germ. Mag.* ii. pl. ii. f. 15.

Body black, very glabrous and shining: head with three faint sulci between the eyes; rostrum short, rather thick, the antennæ inserted near its middle: thorax and elytra as in the preceding species.

Found in such places as the preceding, not unfrequently.

A. flávipes.—Black, glabrous, legs yellow, tarsi black, base of the antennæ rufous, elytra ovate. 1¼.—*Kirby. Germ. Mag.* ii. pl. iv. f. 13. *Cur. flavipes, Fab.*

Body black, somewhat glabrous and shining: head rather elongated, punctulated, with faint striæ between the eyes: rostrum short, shining, slightly incrassated at the base and apex, the antennæ, which are rather long, with the base testaceous, inserted behind its middle: thorax scarcely wider than the head, closely punctate, with a short faintly impressed dorsal line behind: elytra globose-ovate, punctate-striate, the interstices rather flat: legs yellow, tarsi and coxæ black; the two anterior coxæ sometimes yellow.

Frequent in spring in hedges, on stones, and among grass; and in the autumn often very plentiful on the leaves of the hazel. The larva feeds on the *Trifolium repens*, Dutch clover.

A. aprícans.—Black, glabrous, all the thighs, the anterior tibiæ, and the base of the antennæ, testaceous, elytra globose-ovate, gibbous. 1¼–1¾.—*Herbst. Germ. Mag.* ii. pl. iv. f. 14. *A. flavifemoratum, Kirby.*

Head punctulated, rugulose between the eyes; rostrum long, filiform, shining, punctulated, rather thickened in the middle at the insertion of the antennæ; the latter testaceous at the base: thorax thickly punctate, with a faint dorsal line behind: elytra globose-ovate, arched and almost gibbous, somewhat glossy black, slightly tinted with brassy, punctate-striate, the interstices somewhat convex: legs black, the thighs, two anterior coxæ and tibiæ, and all the trochanters, rufo-testaceous.

As this common species is often extremely destructive to agricultural produce, we shall extract the following information regarding its ravages, from Mr Markwick's paper in the sixth volume of the *Linnean Transactions.* "Having ordered a field of clover, consisting of about eight acres, to be saved for seed, my servant, on the 9th of August last, asked me whether I chose to save the whole field for that purpose, saying that he had examined several of the heads, and found the maggot in them. On this information, I was induced to order only a part of the field to be saved for seed, and the rest to be mowed for hay. Soon after, I went myself to examine the state of the clover, and found, in many of the heads, several small white maggots or larvæ, invariably placed on the outside of the base beneath the individual calyx of each floret, eating *through the* bottom, and thereby destroying the germen or rudiment of the future seed. Each of these larvæ appeared to be exactly similar in shape and colour (only much smaller), to the nut maggot, having a white body, black head, and, as I at first imagined, no legs; but I have since discovered, on a closer inspection, assisted by glasses, near the head, three small white scales or prominences on each side, which I suppose may supply the place of legs in this minute insect. I traced it through its chrysalis to its imago or perfect state, in the following manner. Having placed a number of the blighted heads of the clover in a box, which was carefully covered with gauze to prevent any insect from getting either in or out, I found on opening the box on the 19th of the same month, a great number of small black weevils running about in it, and on inspection discovered many of their chrysalids, sticking to the stem at the base of the individual floret, exactly in the same situation as I had before found the larvæ; nay, I even saw one or two of these weevils crawl out from their chrysalids.

"Under these circumstances there can be no doubt that the before mentioned larva changes to a small white chrysalis, which differs but little from it, except in being egg-shaped and motionless; and this produces a small blackish weevil with a long beak, whitish belly, and yellow legs. With regard to the quantity of damage done by this little destructive insect, I know of no better way of ascertaining it, than by taking a comparative view of two of my crops, which grew in two fields adjoining to each other, and which appeared to be equally good with respect to the growth of the plants, but very different in the produce of seed,—this will leave but little doubt that the deficiency of this year's crop has been occasioned by the devastations of these insects, which abounded in an astonishing degree."

Mr Markwick then shews, that in the year 1798, four acres and a-half of clover (*Trifolium pratense*), produced 16¾ bushels of seed, which sold for L. 41 : 17 : 6; while the same quantity of ground in 1800, produced, owing to the ravages of the weevil, only 7½ bushels, worth, at the same price, L. 18, 15s., which leaves a deficiency of L. 23 : 2 : 6.

"Great profits," say Messrs Kirby and Spence, "are sometimes derived by farmers from their crops of *clover seed*, but this does not happen very often; for a small weevil (*A. flavifemoratum*), which abounds every where at almost all times of the year, feeds upon the seed of the purple clover, and in most seasons does the crop considerable damage; so that a plant of the fairest appearance will in consequence of the voracity of this little enemy, produce scarcely any thing. Another species (*A. flavipes,*) infests the Dutch or white clover[*]."

A. Víciæ.—Black, clothed above with a greyish pile, and beneath with a dense white pubescence, antennæ and legs testaceous, elytra ovate. 1¼.—*Kirby*. *Germ. Mag.* ii. pl. iv. f. 15.

Head with faint striæ between the eyes: rostrum short, with a white pile, the apex glabrous and shining, the antennæ, which are rather long and inserted at the middle, entirely of a testaceous colour: thorax rather short, somewhat convex, faintly punctulated, with a short line behind: elytra globose-ovate, with punctured sulci, the interstices flattish: legs testaceous, the four posterior tibiæ, and all the tarsi, dusky-red.

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[*] *Introduction to Entomology*, vol. i. p. 176.

On the *Vicia Cracca*, tufted vetch, occasional. Banks of the Almond, above Cramond Bridge. Water of Leith. July—August.

A. Onónis.—Black, clothed with a very short hoary pubescence, forehead with several striolæ between the eyes, thorax channelled, elytra subglobose. 1¼.—*Kirby*. *Germ. Mag.* ii. pl. iii. f. 24.

Body black, obscured by a hoary pubescence; rostrum rather long, filiform, punctulated, the antennæ, which are entirely black, inserted at the middle: thorax narrow, punctured, with a distinct channel: elytra oblong globose, sulcate-striate, the interstices flattish.

On the *Ononis arvensis*, Restharrow, not unfrequent. Salisbury Craigs. Banks of the Water of Leith at Slateford. Shore west of Granton. July—September.

A. Lathýri.—Black, pubescent, antennæ entirely testaceous, the club distinctly articulated, elytra subglobose. 1⅓ —*Kirby*.

Head with two striæ between the eyes: rostrum rather short, thinly pilose, the apex shining; the antennæ inserted at the middle of the rostrum, entirely pale testaceous, the club rather lax, and the joints distinct: in other respects identical with the preceding species.

Found on the *Lathyrus pratensis*, meadow vetchling, but not common.

A. púnctifrons.—Black, glabrous, elytra subglobose, steel blue, rostrum moderate, head rather wide, punctate between the eyes. 1½.—*Kirby*, *Linn. Trans.* ix. pl. i. f. 9. *Germ. Mag.* ii. pl. iii. f. 6.

Body black, very glabrous and shining: head rather long and broad, smooth and shining behind, punctate between the eyes; rostrum moderate and rather thick in the male, longer and more slender in the female, the antennæ inserted at, or a little before the middle: elytra globose, of a deep steel blue colour, sulcate, the sulci with punctures at regular distances, the spaces between, which are elevated, forming a beautiful catenulated line.

Found not unfrequently in this neighbourhood.

A. subulatum and A. Carduorum, inhabit various parts of Roxburghshire, but we have not observed them in this vicinity.

SUBGENUS—OXÝSTOMA, *Dumeril*. Named from *οξυς*, *sharp*, and *στομα*, *the mouth*, in reference to the narrow, elongated rostrum.—Antennæ straight, inserted at the base of the rostrum towards the under side, 11-jointed, the radical joint rather long and stout, 2d and 3d short, somewhat globose, 4–8 small nodose, the 3 last forming a compact ovate club: rostrum very long, bent downwards: body densely pubescent.

O. Úlicis.—Black, covered with a cinereous pubescence, rostrum black, shining, anterior legs ferruginous. 1½.—*Apion Ulicis*, *Kirby*, *Linn. Trans.* ix. pl. 1. f. 1. *Cur. Ulicis*, *Marsh.*

Entirely covered with short decumbent ash-coloured hairs, beneath which the body is dull black: rostrum glabrous, filiform, rather more than half the length of the body in the female, shorter in the male; antennæ nearly as long as the rostrum, and inserted near its base, the lower joints rufous: thorax with a dorsal channel, deepest behind: elytra rather oblong, convex, and punctate-striated; body beneath pubescent: anterior legs ferruginous, with the thighs black at the base; the four posterior legs black, with the tibiæ rufescent.

On the common furze. It may be found throughout the summer, but is most abundant during the spring months. Braid Hill. Corstorphine Hill. Pentland Hills, &c.

GENUS—RÁMPHUS, *Clairv.* Named from ϱαμφος, the *beak* of a bird.—Antennæ straight, the length of the thorax, inserted beneath the eyes, 11-jointed, the two radical joints much thicker than the others, 3–7 nearly globose, the 4 last closely united, and forming an ovate acute club: rostrum linear, depressed, bent inwards, and closely applied to the breast: eyes united at the inner margin: thorax short, rounded on the sides: elytra obovate: legs free from spines, the thighs much thickened, especially the hinder pair, which are formed for leaping.

R. pulicárius.—Black, somewhat shining, antennæ testaceous, with the club black. $\frac{1}{2}$–$\frac{3}{4}$.—*Ramphus flavicornis, Clairville. Curculio pulicarius, Herbst. Gyllen. Cur. oxyacanthæ, Marsh.*

Wholly black, except the stalk of the antennæ, which is testaceous: head and rostrum minutely punctulated, the latter so closely applied to the thorax that it can be discerned with difficulty: thorax a little convex, somewhat shining and punctured: elytra rather wider than the thorax and somewhat elongate, punctate-striate, with smooth interstices: under side and legs black: the hinder thighs long and thick.

This insect, which is perhaps the most minute of the rostrated beetles, is very closely allied to the genera Orchestes and Tachyerges, with which it has every character in common, except the unbroken antennæ. It is found on the leaves of trees, particularly those of the birch; and leaps with facility by means of its thickened hinder thighs. Found in abundance last summer, on some stunted bushes of sloe thorn, on the southern declivity of Arthur's Seat, nearly opposite the west end of Duddingston Loch.

GENUS—RHÝNCHITES, *Herbst.* From ῥυγχίον, a diminutive from ῥυγχός, *the rostrum.*—Antennæ straight, inserted at the middle of the rostrum on the upper side, 11-jointed, the radical joints rather long, subcylindric, those in the middle slightly obconic or nearly rounded, the three apical ones thick and remote, forming an oval club, of which the two first joints are turbinate, the terminal ovate: rostrum more or less elongate, and dilated at the apex: head likewise elongate, united to the thorax by a thick neck: thorax conico-cylindric: elytra depressed, somewhat elongate-quadrate, the apex of each rounded: legs strong, the anterior pair approximating, without spines, the thighs clavate.

This genus contains about seventeen species, which present considerable variation in form, especially of the rostrum. They frequent the leaves of trees, and many of them are remarkable for the beauty of their colours, particularly R. Bacchus, which in this country is found chiefly in the county of Kent.

R. Bétulæ.—Silky green, or violet blue above, glabrous and shining, under side, legs, and rostrum golden green, the forehead with a faint impression. 3¼-4¼.—*Cur. Betulæ, Linn. Rhynchites Betuleti, Gyllen. Attelabus Betuleti, Fab. Cur. nitens, Marsh.*

Variable in colour, generally some shade of bright green or violet on the upper side, and golden green beneath, the whole body shining and glabrous, especially above: head rugosely punctured, and having a faint impression between the eyes; rostrum longer than the head, rather flat above, and punctured like the head, but more faintly; antennæ black: thorax not margined on the sides, very convex, minutely but distinctly punctured, and obsoletely channelled down the middle: elytra one half wider than the base of the thorax, strongly punctured, the striæ having a tendency to run in lines, which, however, are very irregular: under side thickly punctured, with fine griseous hairs.

By no means of frequent occurrence in this quarter, nor in any part of Scotland. It is found on the whitethorn and alder, and has occurred at Rosslyn.

R. æquátus.—Dull brassy, very thickly punctured, and clothed with fuscous pubescence, elytra rufous, deeply punctate-striate. 1½-2.—*Gyllen. Attelabus æquatus, Fab. Cur. æquatus, Linn. Marsh.*

Body with a strong brassy tint, covered with long erect hairs: head thickly punctured; rostrum as long as the head and thorax, slender, arched, pitch-black, and marked with striæ and oblong punctures; antennæ dusky piceous: thorax dull brassy, thickly punctured, and having an obsolete line in the middle: elytra deep red or pale testaceous, the suture anteriorly generally dusky, deeply punctate-striate, the interstices nearly smooth: under side and legs brassy.

Not common: in a hedge near Slateford.

The following species of this genus are said by Mr Stephens to have been taken at Raehills: A. cylindricus, A. cyaneopennis, A. ophthalmicus, A. aeneo-virens. Deporaus Betulæ, separated from the present genus by Dr Leach, we have taken occasionally in many parts of Roxburghshire, and it also occurs in Dumfries-shire.

GENUS—ATTÉLABUS, *Linn.*—This word, derived probably from *αττειν, to leap*, and *λαβη, a seizure*, was applied by Aristotle to some Orthopterous insects, apparently corresponding to our Gryllidæ, and including perhaps the apterous locusts.—Antennæ straight and strong, inserted at the middle of the rostrum on the upper side, 11-jointed, 1st joint long and thick, 7 following short, somewhat obconic, the three terminal ones united, and forming a cylindric-oval club: rostrum a little shorter than the head, deflexed, thick, dilated at the apex: body ovate, somewhat quadrate: head oblong, not narrowed behind, and inserted into the thorax without a distinct neck: elytra subquadrate: legs long: thighs clavate; tibiæ denticulate internally, and armed with a double hook at the apex.

A. curculionóides.—Black, the thorax and elytra rufous, the latter very finely punctate-striate. 2-2¼.—*Linn. Fab. Marsh. Don.* v. pl. 149.

Head and rostrum black, the former punctured and impressed with an arched line on each side, the latter with an obsolete groove down the middle; antennæ black, the basal half usually ferruginous: thorax convex, glossy testaceous red, very minutely punctured, and having a transverse impressed line behind: elytra convex, the same colour as the thorax, the sides generally a little dusky, finely punctate-striate, with minute scattered punctures on the interstices; the apex of each elytron rounded: under side black and punctured: legs black, the anterior thighs usually rufescent in the middle.

This insect is very abundant near London, and in many other parts of England, but it does not appear to extend far north in considerable numbers, as it is rare in all parts of Scotland which we have had an opportunity of examining, and according to Gyllenhal, occurs but seldom in Sweden. It has been taken by Sir P. Walker on the hazel at Corstorphine Hill.

GENUS—APÓDERUS, *Olivier*. From απο, used to augment the sense of the word with which it is united, and δερη, *the neck*, which is much elongated in this genus.—Antennæ straight, approximating, inserted on the upper side of the rostrum near the middle, 12-jointed; 1st joint longest and most robust; 2d short, 6 following somewhat obconic, the remainder forming a cylindric oval club, of which the terminal joint is minute and retractile: head urn-shaped, eyes placed at the widest part: neck long and rounded: thorax conical, the sides somewhat convex, narrow anteriorly: elytra quadrate, each rounded behind: legs long, the anterior pair approximating; thighs clavate, simple, tibiæ armed internally with a single strong hook; tarsi rather long and spongy beneath.

A. Avellánæ.—Black, thorax, elytra, and middle of the thighs, red. 3–3¼ : 1½–1¾.—*Attelabus Avellanæ*, *Linn.* *Marsh.*

Rostrum, antennæ, and head glossy black; the latter with a longitudinal line behind, extending forward nearly as far as the hinder margin of the eyes, and deeply impressed anteriorly: thorax shining red, encircled behind with an impressed line, having a deep dorsal channel, which is sometimes black in front, as well as the anterior margin: scutellum large, semicircular, black: elytra the colour of the thorax, quadrate, the shoulders rather prominent, the apex of each rounded, with striæ composed of large rounded punctures: body beneath black, punctured; legs rufous, the base and apex of the thighs black; tibiæ dull red in the middle; tarsi black, anterior coxæ with a red mark.

Not of frequent occurrence in the Edinburgh district: it has occurred on the hazel in the woods at Corstorphine, and at Rosslyn. It is found occasionally in hazel coppices in Roxburgh-shire and Dumfries-shire, but it appears to be rather scarce in all parts of Scotland.

FAMILY—SALPINGIDÆ.

The species of this family (with the exception of Mycterus, which feeds on flowers) find their sustenance beneath the bark of decaying trees. They differ in the articulations of the tarsi from the preceding family, having five joints to the anterior and middle pair, and four to the hindermost.

GENUS—SALPÍNGUS, *Illig.* From σαλπιγξ-ιγγος, *a trumpet*, in allusion to the form of the rostrum.—Antennæ about the length of the head and rostrum, inserted before the eyes, straight, 11-jointed, clavate, radical joint robust and globose, 2d and 3d obconic, 4–6 nodose, the remainder forming a club of which the terminal joint is ovate: head prolonged into a broad depressed rostrum, which is contracted in the middle: palpi 4 in number, the terminal joint rather thickest and ovate: thorax somewhat cordate, narrowest behind: body ovate-oblong, the back rather flat, the elytra wider than the head and thorax: tarsi short, villose beneath.

S. ruficóllis.—Reddish-yellow, the crown of the head and the elytra bluish-black, abdomen piceous. 1½.—*Cur. ruficollis, Linn. Anthribus Roboris, Fab.*

Head and rostrum pale testaceous, the former bluish-black on the crown; eyes dark brown; antennæ ferruginous, the apex dusky: thorax wide in front, the sides dilated before the middle, the hinder part considerably narrowed, of a pale testaceous colour, glossy, and rather thickly punctured, with four faint impressions on the disk: elytra bluish-black, sometimes tinged with green, very glossy, punctate-striate, the alternate interstices with a few scattered punctures: under side ferruginous red, punctured: legs testaceous red.

Not common. On the trunk of a tree in the Botanic Garden, *Mr Wm. Burn.* Corstorphine Hill and Rosslyn.

S. laniróstris.—Dark brown, glossy, and strongly tinted with brassy, rostrum and legs pale testaceous. 1¼–1¾.—*Cur. planirostris, Marsh. Anthribus fulvirostris, Payk.*

Rostrum rather wide, punctured, pale testaceous; head brownish-black, brassy, punctured; antennæ the colour of the rostrum, the apex obscure: thorax brassy-brown, punctured, and impressed with four very indistinct foveolæ: elytra the colour of the thorax, punctate-striate, the alternate interstices with a few remote punctures, and the disk with a slight transverse depression near the base: under side pitchy: legs testaceous.

Not unfrequent on the trunks of trees, lurking in the crevices of the bark. Duddingston Wood. Woods at Cramond, Dalkeith, Rosslyn, &c.

SUBGENUS—SPHÆRIÉSTES, *Kirby.*—Antennæ rather longer than the head and rostrum, the radical joint subglobose, 2d and 3d rather elongate, obconic, the 5 last thickening gradually to the terminal one, which is somewhat obovate and obtuse: rostrum very short: body rather elongate.

S. áter.—Black, tinted with brassy, base of the antennæ and tarsi pitchy-red, thorax rather short, very thickly punctured and impressed with two foveolæ. 1½–1¾.—*Salpingus ater, Gyllen.*

Body black, with a brassy lustre; head wide, depressed, thickly punctured, and a little produced anteriorly; antennæ pitchy-red at the base, dusky black at the apex: thorax dilated on the sides before the middle, the surface thickly and rather deeply punctured, and impressed with an ovate fovea on each side before the middle: elytra with a very obsolete transverse impression before the middle, deeply punctate-striate, the alternate spaces with a few remote punctures: under side shining black, the abdomen occasionally piceous; legs likewise black, the tarsi obscure red.

Has been found at Cramond in small numbers. We have seen Scotch specimens of what Gyllenhal considers an immature variety of this species, but which Mr Stephens has distinguished as a species by the name of *S. immaculatus*, seemingly with propriety, as it appears to present other distinctive marks besides difference of colour.

S. foveolátus.—Brassy-black, base of the antennæ and tarsi ferruginous, thorax unequal, each elytron with an ovate fovea before the middle. 2¼–2½.—*Salp. foveolatus, Gyllen. Ins. Swe.* iv. 524.

Shining black, with a brassy tint; head large, thickly punctured, and having a faint impression between the antennæ; the eyes small, round, and very prominent; rostrum small, minutely punctured, dull testaceous; the basal half of the antennæ of a similar hue, the rest blackish, with cinereous pubescence: thorax a little convex above, covered with large punctures, and having a large impression on each side somewhat in the shape of a horse shoe, with the open part towards the outer margin: elytra nearly linear, the shoulders rectangular; punctate-striate, the punctures becoming scattered at the base and apex, the disk before the middle marked with a large, rather deep, ovate fovea, placed transversely: under side black, more or less punctured; legs black, the tarsi, and sometimes the base of the tibiæ, dull ferruginous.

Allied to *S. ater*, but readily discriminated by its much greater size, and other obvious characters.

This interesting addition to the British Coleoptera we owe to the assiduity of the Rev. Wm. Little, by whom the insect was taken, last summer, on the trunk of a tree at Cramond. It is a rare species on the continent, having been found only on two or three occasions, and in small numbers.

SUBSECTION—LONGICORNES.

FAMILY—CERAMBYCIDÆ.

THIS very numerous and elegantly formed family exist in timber during their earlier stages. The larvæ are nearly apodal or with very small feet; the body is soft and whitish, largest anteriorly, with a scaly head and strong mandibles. They are destructive in their habits, and pierce through the interior of the largest trees. In the perfect state the abdomen of the female is usually terminated by a tubular and corneous oviduct, and the antennæ are, for the most part, shorter than those of the males. Many species produce a sharpish sound by rubbing a portion of the thorax against the pedicle which attaches the base of the abdomen. Lister calls this sound querulous, while Dumeril compares it to the braying of an ass. It is by reason of this propensity that *Prionus coriarius* is known in Germany under the name of the *Fiddler*. Some species are nocturnal, and frequent old woods and the trunks of ancient trees. Others occur on flowers, and are richly gilded or adorned with various colours, while all are remarkable for their elongated bodies, slender limbs, and very long and delicately formed antennæ.

The deficiency of wood in Scotland is a circumstance unfavourable to the frequent occurrence of insects of this family. Certain districts in the neighbourhood of Edinburgh, such as Dalkeith and Rosslyn, are pretty well adorned in this respect, yet they have not hitherto furnished any considerable number of the species characteristic of wooded regions. It will accordingly be perceived that our Cerambycidæ, Lepturidæ, and other insects, the habitat of which is chiefly *sylvan*, are not proportionate in number to many other families. It is indeed probable that not very many of these insects occur in Scotland. We may remark, that even of the English species, so called, some of the finest are not original inhabitants of Britain, but have been accidentally imported from other countries, and in process of time naturalised. Their proper geographical position is in the countries adjoining the equator, and they seem to diminish in number in proportion to the distance from the torrid zone. "Bleak Caledonia" is considerably to the north of the limit where they cease to be common, and presents few local peculiarities at all favourable to their increase.

In addition to the small number of aboriginal species which have been taken near Edinburgh, the following have been captured in Scotland:—*Rhagium Indagator, R. inquisitor, Saperda scalaris, Leptura quadrifasciata, Leptura lævis,* and *Callidium striatum;* the latter in Forfarshire.

GENUS—ACANTHÓCINUS, *Megerle.* Antennæ of the male more than four times the length of the body, those of the female above twice its length, radical joint somewhat robust, 2d short, 3d longer than the 4th, the remainder nearly equal in the female, but gradually lengthening in the male to the terminal joint which is very long and slender: palpi short, the terminal joint fusiform, acute: body rather depressed: thórax transverse, having a spine on each side: legs robust.

A. aedílis.—Brownish, thickly clothed with greyish hairs, elytra with two irregular fuscous fasciæ, the hinder one abbreviated. 7–9.—*Cerambyx aedilis, Linn.*

Body short and depressed; the colour brownish, and the surface more or less thickly covered with ash-coloured pubescence: head punctured, and having a shallow groove on the forehead; antennæ of the male four or five times the length of the body, those of the female twice its length, the base of the joints brownish, and covered with cinereous pubescence, the apex black: thorax thickly and ruggedly punctured, with a strong spine on each side, and four tufts of yellowish pile placed across the disk before the middle: elytra with the apex of each rounded, the upper surface unequal, pale brown, with cinereous pubescence and a few scattered tufts of black pile, the base punctate, the apex nearly smooth, having an oblique irregular fuscous fascia anteriorly, and another, somewhat abbreviated, behind: under side ferruginous, clothed with whitish glossy pubescence: legs brownish, pubescent, the tarsi somewhat dusky.

The abdomen of the male has the anal segment short and emarginate, but in the female it is produced into a long conical tube of a black colour.

Specimens of this insect from the neighbourhood of Kirkcaldy are preserved in the cabinet of Sir P. Walker. It is a northern species, and most British examples have occurred in Scotland. "Habitat frequens," says Linné, speaking with reference to Sweden, "in linteribus et arborum truncis decorticatis, dum ex his domos struunt ruricolæ, hinc pueris nostris dicitur *Timberman* (which he renders by the word *aedilis*, adopted as the specific name) omnibus notissima species: vulgus hunc lædere religiose apud nos ducet*."

GENUS—POGÓNOCHERUS, *Megerle.* From πωγων, *hairy*, and κερας, *a horn*, the antennæ being very pilose in some of the species.—Antennæ one-half longer than the body in the male, the radical joint very robust, the others gradually decreasing from the 3d to the apex: palpi unequal, the maxillary pair being longest, the terminal joint of both rather slender and acute: head small, and bent inwards: thorax transverse, having a spine on each side: legs not very long; thighs clavate, the tibiæ of the middle pair of legs with a single tooth on the outside.

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* *Faun. Suecica.*

P. nebulósus.—Brownish-black, the elytra with an irregular greyish fascia and spots of the same colour, antennæ and legs variegated with ferruginous. 3–4 : 1¼.—*Cerambyx nebulosus*, *Linn.* *Marsh.* *Don.* xi. pl. 394.

Brownish-black, the pubescence very short and of an ash colour: head with an impressed line down the middle throughout its whole length; mouth obscurely ferruginous; antennæ scarcely twice the length of the body, the base of the joints ferruginous, the apex black: thorax thinly punctured, the sides rather densely pubescent and furnished with an acute spine, the anterior and hinder margins often slightly ferruginous: elytra thickly punctured towards the base, where a few very obsoletely elevated lines are likewise perceptible, the colour brownish-black, irregularly spotted with ashy-white spots, and having a fascia of the latter colour near the middle: under side black, with cinereous hairs having a silky gloss; legs similar, the thighs ferruginous at the base, the tibiæ with a ferruginous ring before the middle.

Not a common insect in Scotland; it has been taken at Cramond and Rosslyn, and in Dumfries-shire.

GENUS—CLÝTUS, *Fab.*—Antennæ not so long as the body, inserted in front of the head close to the eyes, the radical joint long, bent, and robust, 2d very short, subglobose, 3d long and slender, the remaining eight decreasing in length, terminal ovate, rather acute: palpi with the terminal joint much the largest, dilated and wedge-shaped (Pl. II. fig. 4.): head short, deflexed: thorax globose: elytra elongate, not covering the abdomen: legs long; thighs clavate; tibiæ with two spurs at the apex; tarsi 4-jointed, the penultimate joint bilobed.—*Curtis, B. E.* v. 199.

C. Aríetis.—Dull black, front and base of the thorax yellow, elytra with four yellow fasciæ, the second from the base curved obliquely forward to the suture. 4–5½.—*Leptura Arietis, Linn.* *Don.* i. pl. 27. *Cerambyx Arietis, Marsh.*

Head black, coarsely punctured, having a few erect cinereous hairs and a short yellow line on each side; antennæ pale ferruginous, the tip usually dusky: thorax nearly globose, black, pubescent, the front and base with a yellow margin, the hinder one narrowest and occasionally interrupted in the middle: scutellum yellow: elytra rounded on the shoulders, of a deep black colour, thickly and rather minutely punctured, each with a short transverse band of yellow anteriorly, a second rising near the middle of the outer margin and curved obliquely forwards to the suture, a third behind the middle, bent a little backwards, the apex likewise yellow: under side black, punctured, the segments of the abdomen margined with yellow: legs ferruginous-red, pubescent, the thighs somewhat pitchy.

Apparently a scarce insect in Scotland: we have seen few indigenous specimens besides those in the possession of Sir Patrick Walker, which were taken near Drumsheugh, immediately to the west of Edinburgh. It is the most abundant member of the genus in the neighbourhood of London, and throughout the greater part of the south of England.

FAMILY—LEPTURIDÆ.

The genus *Leptura,* as established by Linnæus, contained many insects which are now distributed through other genera, such as *Stenocorus* of Geoffroy, and *Donacia* of Fabricius. Under the same denomination, Geoffroy included the genera *Saperda, Callidium, Clytra,* and a portion of *Molorchus* of Fabricius. The *Lepturidæ,* in the larva state, live in wood, and resemble the *Cerambycidæ* in their habits. The general deficiency of timber trees, and of extended tracts of wooded country throughout Scotland, renders the lignivorous tribes of rare occurrence in our quarter of the kingdom. The digestive canal among the typical *Lepturidæ* is composed of a very short crop; the chylific ventricle opens almost from the head; it is nearly straight, beset with short obtuse papillæ, more obvious on the anterior portion; the small intestine is folded on itself, filiform, and swelling into an oblong cæcum, terminated by a short rectum. The hepatic vessels are six in number, and are inserted separately at the base of the chylific ventricle; they form many circumvolutions, and unite in two bundles of three each, which border on the commencement of the cæcum. Of the genus *Leptura,* properly so called, we have met with only one species in the Edinburgh district, although nineteen inhabit Britain.

Genus—RHÁGIUM, *Fab.* Name said by Olivier to be from *Ρακις*, *a spine,* in reference to the appearance of the thorax; by others supposed, with greater probability, to be from *ϱηγιον*, referring to the habits of the lignivorous larvæ.—Antennæ considerably shorter than the body, and rather robust, 11-jointed, the radical joint longest, robust and slightly bent, 2d very short, 3d rather longer than the 4th, the remainder nearly of equal length, but their proportions somewhat varying in the different species: palpi with the terminal joint dilated and wedge-shaped: head large, with a callosity behind the eyes: thorax with a strong spine on each side: legs robust, and not very long; thighs clavate; tarsi 4-jointed, the penultimate joint bilobed, the unguicular one clavate and slender.

Mr Kirby gives the following account of the larva of a species of this genus *(R. fasciatum),* which he received from Mr Joseph Sparshall of Norwich. On the ten intermediate segments of the under side of the body, which, in the centre, form a fleshy protuberance, it has on it a double series of rasps, as it were, consisting each of two rows of oblique oblong prominences; and on the seven intermediate *dorsal* segments, there are also in the centre seven rasps, of three or four each, of similar prominences; so that this animal at the same time can push itself along both by dorsal and ventral prolegs. It was noted that a pair of these rasps was between the 2d and 3d pair of true legs.

R. bifasciátum.—Brownish-black, shining, elytra with two oblique abbreviated testaceous yellow fasciæ, the external margin and apex of the abdomen rufous. Fem. 9–10. Male considerably smaller. *Fab. Don.* iii. pl. 94. f. 1, *Cerambyx anglicus, Gmel. Stew.*

Brownish-black, shining; head with yellowish pubescence, having a deep groove along the centre, and large punctures between the eyes; palpi black; antennæ dark rufous; thorax a little constricted before and behind, having a strong acute spine on each side, and a smooth shining longitudinal space in the centre: elytra widest at the shoulders, and rectangular, a little narrowed towards the apex, with three elevated smooth lines on each, and two oblique testaceous yellow fasciæ, not reaching to the suture, the outer margin more or less widely rufous: under side blackish, shining, with yellowish ashy pile, the terminal segments of the abdomen reddish: base of the thighs and tibiæ rufescent, tarsi dusky.

In decaying trunks of trees, not uncommon throughout Scotland. Rosslyn, plentiful in October. Woods on the banks of the Almond.

GENUS—LEPTÚRA, *Linn.* Name from *λιπτος*, *slender*, and *ὄυρα*, *the tail*, with reference to the attenuated form of the elytra.—Antennæ considerably more than half the length of the body, 1st joint robust, 2d very short, 3d longer than the 1st, 4th shorter than the 3d, 5th equal to the 3d, the remainder diminishing in length, terminal with the apex acute: palpi 4-jointed, with the terminal joint longest, somewhat oval (Pl. II. fig. 5.): thorax conical, without lateral spines: elytra gradually diminishing in breadth to the apex: legs long; tibiæ with spurs at the apex; tarsi 5-jointed, but apparently 4-jointed, the 4th from the base being very minute.—*Curtis, B. E.* viii. 362.

L. ruficórnis.—Sublinear, brownish-black, with griseous pubescence, antennæ and legs testaceous, variegated with black. 3–3½ : ¾.—*Fab. Lep. femorata, Marsh.*

Black, clothed with fine pubescence, of a yellowish hue in certain lights: head punctured; palpi and antennæ testaceous, the latter with all the joints, except the two basal ones, tipped with black: thorax rather convex, the hinder margin a little elevated, the surface very closely punctured: elytra nearly of equal breadth throughout, more thickly and deeply punctate than the thorax, the apex nearly rounded: body beneath black, sparingly pubescent: legs rufous; anterior pair, with the apex of the thighs on the upper side, and the tarsi, black; the second pair, with the apex of the thighs, base of the tibiæ and tarsi, black: the posterior entirely black, with the base of the thighs rufous.

Not common: in tolerable plenty on the flowers of the Hawthorn, by the side of the Water of Leith, about a mile above Slateford: we have not met with it elsewhere in Scotland.

SECTION—V.

SUBSECTION—EUPODA.

THIS forms the fifth family of Latreille's Tetramerous Coleoptera. Some of its component parts are nearly allied to the *Longicornes*, or preceding tribes, while others so much resemble the *Chrysomelæ*, as to have been arranged with the latter by Linnæus. They are all winged insects, and occur on the stems and leaves of various plants, especially, so far at least as many of the European species are concerned, on the liliaceous tribes. The larvæ of the *Donaciæ* feed on the internal portion of the roots of aquatic plants. Those of other genera live exposed, but, after the manner of the *Cassidæ*, cover themselves with a case or scabbard formed of their own excrementitious matter.

FAMILY—CRIOCERIDÆ.

GENUS—DONÁCIA, *Fab.*—Antennæ about half the length of the body approximating, 1st joint long, robust, obconic, 2d and 3d shortest, remaining longer than the 3d, terminal elongate-ovate: palpi filiform, terminal joint pointed: mandibles bifid or notched at the apex: thorax cylindric, with a tubercle on each side anteriorly: elytra more or less triangular, the apex generally obliquely truncate: thighs long and clavate: last joint of the tarsi not elongated.—*Lat.* iii. 46.

The genus *Donacia* was confounded with *Leptura* by Linnæus and De Geer, and with *Stenochorus* by Geoffroy. It was established by Fabricius under its present name, from *Δοναξ, a reed,* on account of the insects of which it is composed being found on reeds, and other aquatic plants, such as those of the genus *Iris*, *Sagittaria*, *Nymphæa*, &c. to which they cling with great tenacity, and on the roots of which the larvæ are supposed to feed. In the form of their bodies and antennæ they shew an alliance to the *Cerambycidæ;* but their habits, and the structure of the cibarian organs, ally them still more closely to *Crioceris* and *Galeruca*. They are frequently bronzed or gilded in their aspect, and are covered in some cases by a fine silky down, which is supposed to prove useful to them when they fall into the water. Indeed, even in the perfect state, they are partly aquatic, and may be seen to seek repose and shelter on the under side of the leaf of the water-lily, where they are necessarily submerged. According to M. A. Brogniart, the chrysalids are attached to their filaments by one edge only. M. Leon Dufour inclines to think, in consequence of anatomical investigation, that the *Donaciæ* ought to be formed into a particular family. His observations, as we are informed by M. Latreille, demonstrate that their hepatic vessels, in number, form, structure, and arrangement, constitute a very remarkable exception to those of the Tetramera, and one which even appears peculiar to the genus. These vessels only open into the chylific ventricle, while, in all the other Tetramera which M. Dufour has dissected, they have two insertions, one of which is ventricular and the other cæcal. These biliary ducts, which are only four in number, are of two different kinds: the first are capillary, and disposed in two strongly flexed curves, and are inserted by four distinct ends into a short obround vesicle, placed at the inferior and somewhat lateral extremity of the chylific ventricle; the others are much shorter, thicker, more dilatable, thin and tapering at both ends, with one extremity free, and inserted separately by the other into the superior and dorsal region of the ventricle. They contain a whitish pulp, which is regarded as an alimentary substance. The œsophagus is *capillary,* and has no dilatation in the form of a crop. The chylific ventricle is beset with projecting papillæ [*]. Britain produces about twenty species of *Donacia*—a great amount, when we consider that De Jean's Catalogue contains only twenty-six in all. The genus may be regarded as charâcteristic of Europe, for scarcely any occur in other countries, although a few have been collected in America.

A. *Hinder thighs (in the male) with two teeth.*

D. cíncta.—Rather convex, greenish-brass above, with a violet tinge, covered with silvery down beneath, elytra crenate-striate, the interstices and disk of the thorax wrinkled across, the thighs of the male with two teeth at the apex. 4.—*Germar. D. bidens, Oliv. Gyllen.*

Head very faintly punctured and pubescent, with a groove down the middle; antennæ black, the base of the joints ferruginous: thorax nearly quadrate, punctured, with an oblong tubercle on each of the anterior angles, an abbreviated groove in the middle, and transverse wrinkles on the disk: elytra much elevated at the shoulders, the apex widely truncate, of a silken-green colour on the sides, the middle dusky-violet, marked with crenate striæ, the spaces between which are wrinkled across: under side very densely clothed with down, which has a silvery lustre when seen from the front, but is of a dusky leaden colour when viewed from behind: thighs dusky, tinged with violet, the base testaceous, the hinder pair with two teeth at the apex; tibiæ and tarsi dull testaceous.—The thighs of the female are furnished with only one tooth.

Duddingston Loch, and Ravelrig Toll Moss. Scarce in most situations.

B. *Hinder thighs with a single tooth.*

D. Lémnæ.—Rather depressed, brownish-brass above, thorax rugosely punctured, elytra with several depressions, having a purple band along the outer margin, and an abbreviated one at the base internally. 4–4¾. *Fab. Lep. vittata, Marsh.*

Body rather depressed, brass-yellow tinged with green: head and lower joints of the antennæ with a short dense yellow pubescence; forehead with a deep longitudinal line, extending as far back as the hinder margin of the eyes, and a tubercular elevation on each side between it and the eyes: thorax thickly punctate, with a shallow dorsal line, the sides with short transverse striæ: elytra twice the breadth of the thorax at the base, the shoulders considerably elevated and rectangular, attenuated towards the apex, which is truncate; the surface unequal, having a depression behind the scutellum, and two others on the back of each elytron; rather deeply punctate-striate, the punctures scattered near the shoulder, the interstices finely coriaceous; the colour dusky brass, with a purple band along the external margin, and occasionally an oblong spot of the same colour, like the commencement of another band, near the middle of the base: under side covered with cinereous hairs, having a silky gloss, and which are occasionally tinged with yellow: legs black tinged with green, and covered with short cinereous hairs, the hinder thighs with a minute tooth near the apex.

On the leaves of the Iris Pseudacorus, and other marsh plants. Duddingston Loch, rather plentiful. Lochend.

D. Sagittáriæ.—Rather depressed, silky-green above, covered with golden-yellow down beneath, elytra with several depressions, finely punctate-striate, the punctures somewhat scattered at the base. 4½–5.—*Fab. Gyllen. D. aurea, Hoppe. Lep. Sagittariæ, Marsh.*

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[*] *Regne Animal*, t. 5, p. 1 6.

The upper surface of a brassy or yellowish-green colour with a silky gloss; head and neck thickly punctured, the forehead with a deep groove; antennæ black, the basal joint greenish: thorax with all the angles somewhat prominent, the surface thickly punctured, and having a groove down the middle, the tubercle on each side anteriorly scarcely observable: elytra similar in form, and in the impressions on their surface, to those of the preceding species, the colour yellowish-green with a silky gloss: under side brassy-green, thickly clothed with shining golden-yellow down; legs of a similar hue, the hinder pair with a small tooth.

With the preceding species, not very frequent.

D. serícea.—Metallic above, variable in colour, covered with golden down beneath, elytra punctate-striate, rather depressed on the back and impressed, the apex rounded, antennæ and legs rather short and thick. 3½–4.—*Gyllen. Lep. sericea, Linn. Lep. Nymphææ, Marsh. D. Proteus, Kunzè. Steph.*

Very variable in colour, most commonly brassy, coppery-red, or purplish, not unfrequently tinged with green, and occasionally nearly black: forehead grooved; antennæ rather short and stout, the radical joints with a metallic lustre: thorax rather depressed above, nearly quadrate in form, channelled down the centre and rather rugose: elytra ovate, rounded at the apex, punctate-striate, depressed on the back, and marked with an obsolete impression: legs usually the colour of the upper surface, the hinder thighs furnished with a strong tooth near the apex.

On the leaves of the Potamogeton natans in Braid Hill marshes. By the sides of small streams and in marshy spots among the Pentland Hills rather common.

C. *Hinder thighs without a tooth.*

D. símplex.—Rather short and convex, greenish-brass above, covered with glossy ash-coloured down beneath, legs dusky ferruginous, elytra coppery-red on the disk, and crenate-striate. 3½–4¼.—*Fab. Leptura melanocephala, Marsh.*

Head covered with small punctures and ash-coloured hairs, the groove down the middle often interrupted, the colour dusky, with a brassy gloss; antennæ brownish-black, the radical joints often reddish at the base: thorax greenish brass, rather convex, very thickly punctured, the dorsal channel and the anterior tubercles obsolete: elytra with elevated shoulders, the apex obtusely rounded, the surface rather convex and without depressions: deeply crenate-striate, the interstices wrinkled across, the disk of a coppery-red colour, the sides usually brassy-green: under side covered with ashy down having a silvery lustre; legs dull ferruginous, the thighs dusky near the apex.

Not so common as most of the other species. Marshes near Currie Pentland Hills.

D. lineáris.—Elongate and rather depressed, dull greenish-brass above, covered with silvery down beneath, the antennæ and legs variegated with ferruginous, the elytra with fine transverse lines. 4–4¾.—*Hope. Leptura linearis, Marsh. D. simplex, Oliv.*

Body longer and narrower than in the other species, dull brassy above glossed with green; head not shining, minutely punctured and pubescent, marked with a short groove; antennæ black, the joints more or less reddish at the base: thorax nearly quadrate, but rather widest in front, the surface somewhat depressed, punctured, and marked with a scarcely perceptible groove: elytra truncate at the apex, rather depressed, marked with two faint depressions on the back, and deep regular striæ composed of rounded punctures, the spaces between the striæ as if scratched across: under side covered with silvery down,: thighs brassy, testaceous at the base; tibiæ dusky testaceous, tarsi brownish.

The most plentiful species of the genus, occurring abundantly on marsh plants at Duddingston Loch, Lochend, Ditches at Craigcrook, &c. from May to August.

GENUS—CRIÓCERIS, *Geoffroy.* From *κϱιος, a ram*, and *κεϱας, a horn*, in allusion to the antennæ, which are rather rigid.—Antennæ inserted near each other before the eyes, longer than the thorax, 1st joint globose, 2d small, the rest nearly of equal size, oblong, terminal conical (Pl. II. fig. 6.): external maxillary palpi with the 4th, or terminal joint, elongate oval: mandibles bifid at the apex, one of them with a tooth near the middle: head nutant, united to the thorax by a short neck: eyes prominent, notched on the inside: thorax cylindric, not margined: elytra subquadrate: legs short and strong, the thighs thickened, the tarsi 4-jointed.—*Latr.* iii. 47. *Curtis, B. E.* vii. 323.

The genus Crioceris was formed by Geoffroy from the Chrysomela of Linn., and corresponds to Lema in the Fabrician system. The species are of small size, their bodies are narrow and elongated, and frequently ornamented with lively colours. They live on the leaves of various plants, Liliaceæ, Asparagi, &c. and occur in gardens and meadows. When seized, they make a sharp sound by rubbing the superior extremity of the abdomen against the inferior extremity of the elytra. The larvæ feed on the plants in which we usually find the perfect insects, and are somewhat adhesive by means of their six scaly feet. Their bodies are soft, short, and inflated, and they protect themselves from the action of the sun and the changes in the season, by covering their backs with their own excrements. They are subterranean in the nympha state. The species are numerous as the genus was originally constituted, but it has been greatly restricted in recent times. Mr Stephens gives seven as the amount of British species.

C. cyanélla.—Deep blue, very glossy, the antennæ and tarsi black, thorax thinly punctured. 1¾.—*Payk. Chrys. cyanella, Linn. Auchenia cyanella, Marsh. Lema cyanella, Fab. Gyllen.*

Dark blue, glabrous and shining: head with some impressions between the eyes, and a channel on the back part; antennæ black: thorax rather convex in front, subglobose, contracted behind the middle, thinly punctured, with a transverse impression behind which has a large puncture in the centre: elytra twice the breadth of the thorax, quadrate, with ten deeply punctured striæ on each, the sutural one forked at the base: body beneath shining blue, punctured; legs blue, the tarsi black.

On plants and in grassy places about midsummer, and in autumn, not very common. Rosslyn Woods.

C. melanópa.—Shining blue, thorax and legs red, antennæ and tarsi black. 2½.—*Payk. Chrys. melanopa, Linn. Auchenia melanopa, Marsh. Lema melanopa, Fab. Gyllen.*

Head blue-black, channelled behind; antennæ black: thorax convex, contracted behind, smooth and shining, of a clear red colour, with a few scattered punctures: elytra somewhat elongate-ovate, blue, glabrous, and very glossy, with ten deeply punctate striæ on each, and an abbreviated one

The upper surface of a brassy or yellowish-green colour with a silky gloss; head and neck thickly punctured, the forehead with a deep groove; antennæ black, the basal joint greenish: thorax with all the angles somewhat prominent, the surface thickly punctured, and having a groove down the middle, the tubercle on each side anteriorly scarcely observable: elytra similar in form, and in the impressions on their surface, to those of the preceding species, the colour yellowish-green with a silky gloss: under side brassy-green, thickly clothed with shining golden-yellow down; legs of a similar hue, the hinder pair with a small tooth.

With the preceding species, not very frequent.

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Very variable in colour, most commonly brassy, coppery-red, or purplish, not unfrequently tinged with green, and occasionally nearly black: forehead grooved; antennæ rather short and stout, the radical joints with a metallic lustre: thorax rather depressed above, nearly quadrate in form, channelled down the centre and rather rugose: elytra ovate, rounded at the apex, punctate-striate, depressed on the back, and marked with an obsolete impression: legs usually the colour of the upper surface, the hinder thighs furnished with a strong tooth near the apex.

On the leaves of the Potamogeton natans in Braid Hill marshes. By the sides of small streams and in marshy spots among the Pentland Hills, rather common.

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Head covered with small punctures and ash-coloured hairs, the groove down the middle often interrupted, the colour dusky, with a brassy gloss; antennæ brownish-black, the radical joints often reddish at the base: thorax greenish brass, rather convex, very thickly punctured, the dorsal channel and the anterior tubercles obsolete: elytra with elevated shoulders, the apex obtusely rounded, the surface rather convex and without depressions; deeply crenate-striate, the interstices wrinkled across, the disk of a coppery-red colour, the sides usually brassy-green: under side covered with ashy down having a silvery lustre; legs dull ferruginous, the thighs dusky near the apex.

Not so common as most of the other species. Marshes near Currie. Pentland Hills.

D. lineáris.—Elongate and rather depressed, dull greenish-brass above, covered with silvery down beneath, the antennæ and legs variegated with ferruginous, the elytra with fine transverse lines. 4–4¾.—*Höppe. Leptura linearis, Marsh. D. simplex, Oliv.*

Body longer and narrower than in the other species, dull brassy above, glossed with green; head not shining, minutely punctured and pubescent, marked with a short groove; antennæ black, the joints more or less reddish at the base: thorax nearly quadrate, but rather widest in front, the surface somewhat depressed, punctured, and marked with a scarcely perceptible groove: elytra truncate at the apex, rather depressed, marked with four faint depressions on the back, and deep regular striæ composed of rounded punctures, the spaces between the striæ as if scratched across: under side covered with silvery down,: thighs brassy, testaceous at the base; tibiæ dusky testaceous, tarsi brownish.

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On plants and in grassy places about midsummer, and in autumn, not very common. Rosslyn Woods.

C. melanópa.—Shining blue, thorax and legs red, antennæ and tarsi black. 2½.—*Payk. Chrys. melanopa, Linn. Auchenia melanopa, Marsh. Lema melanopa, Fab. Gyllen.*

Head blue-black, channelled behind; antennæ black: thorax convex, contracted behind, smooth and shining, of a clear red colour, with a few scattered punctures: elytra somewhat elongate-ovate, blue, glabrous, and very glossy, with ten deeply punctate striæ on each, and an abbreviated one on the 2d interstice at the base, the back anteriorly somewhat impressed, and the shoulders prominent: legs red; coxæ, trochanters, tarsi, and apex of the tibiæ, black.

More frequent than the preceding, found in grassy places, and on stones in warm weather.

C. Aspáragi.—Dark blue, thorax red, elytra yellow, with a cross on the suture and two spots on each of a dark blue colour. 2½–3.—*Chrys. Asparagi, Linn. Don.* i. pl. 28. *Lema Asparagi, Fab. Gyllen.*

Head bluish-green, finely punctulated, with a groove on the forehead; antennæ black: thorax rather convex, shining red, thickly and minutely punctured, sometimes having two small blackish-blue spots in the middle: elytra deeply punctate-striate, testaceous-yellow, with a broad stripe down the suture, a quadrangular spot in the middle connected with it, an oblong mark on the shoulder sometimes prolonged to the suture, and another of an ovate form within the apex, all of a bluish-green colour: under side dark blue, sometimes tinged with green: legs of a similar colour, the tibiæ occasionally ferruginous at the base.

Apparently very rare in Scotland. It has been taken in this neighbourhood by Sir P. Walker. The larva feeds on the leaves of the common Asparagus.

SUBSECTION—CYCLICA.

This forms the sixth family of M. Latreille's Tetramerous section. It appears from the anatomical researches of M. Leon Dufour, that the alimentary canal is at least thrice the length of the body in such of the genera as have been examined; that the œsophagus is usually inflated behind the crop, and that the chylific ventricle or stomach is generally smooth, at least throughout a great part of its length. The biliary apparatus resembles that of the Cerambycidæ and other longicornes in the number and double insertion of the vessels of which it is composed;—these amount to six, two of which (except in the genus Cassida) are for the most part shorter and more slender. The larvæ have six feet; their bodies are soft and frequently coloured. They feed, like the perfect insect, on the leaves of plants, to which they adhere by means of a viscid humour. Some enter the earth prior to their assumption of the nympha state, while others undergo that change fixed to the plant on which they fed, and partly encompassed by the exuvia of the larva. The perfect insects are of small size, but they are frequently adorned by brilliant colours and metallic splendour. They are slow and timorous in their general movements, and when attempted to be seized, closely fold their feet and antennæ, and drop to the ground. Several species are good leapers and the females are extremely prolific.

FAMILY—GALERUCIDÆ.

Genus—GALERÚCA, *Geoffroy*. The generic appellation is a Latin word signifying a helmet.—Antennæ not so long as the body, filiform, 11-jointed, the radical joint longest, the 2d shortest, the nearly equal or slightly decreasing in length, somewhat obconic: palpi short, the terminal joint ovate: mandibles tridentate at the apex: head transverse, narrowed towards the mouth: thorax likewise transverse, the sides somewhat convex: elytra large, ovate, or elliptical: thighs stout; tibiæ without spines: tarsi 5-jointed, but apparently 4-jointed, the 4th from the base being very minute, the three first joints cushioned beneath, unguicular one naked.—*Latr.* iii. 61. *Curtis, B. E.* viii. 371.

This genus, like the preceding, was also formed by a dismemberment of the Linnæan genus Chrysomela. Like the species of the latter genus, they are slow in their movements, and though provided with wings they rarely use them. They love fresh and shady places, where they gnaw the leaves of plants, and on the slightest appearance of danger they drop into the grass, or imitate death if seized. The larvæ also feed on the substance of various leaves, and eat incessantly till about to assume their metamorphoses. They are of an elongated form, composed of 12 distinct segments, and have six scaly feet, each furnished with a crotchet. The last segment is provided with a fleshy excrescence, which serves the purpose of a seventh foot, and by exuding a gluey liquid, supports the animal on the plane of its position. When the plant on which they are settled is touched, they immediately tumble off, and roll themselves into a circle. About the month of June they assume the nympha state, in which all the parts of the perfect insect, such as the eyes, antennæ, legs, elytra, and wings, are sufficiently perceptible. Although we have not above 13 British species of Galeruca, the genus is very extensive in relation to foreign countries. De Jean enumerates 82 species, most of which are from America.

G. Tanacéti.—Black, the upper surface deeply and coarsely punctured, elytra with obsolete elevated lines. 3¾–4¾.—*Fab.* *Chry. Tanaceti, Linn.* *Marsh.* *Samou. Compend.* pl. 2. f. 13.

Body wholly black, and slightly shining, nearly destitute of hairs: head convex, rugosely punctured, and having an obsolete frontal groove; antennæ black: thorax very short, the sides rounded before the middle, and having the margin reflexed, the basal line with three slight sinuosities; the surface rendered unequal by a few obsolete impressions, and large confluent punctures: elytra large, the apex obtusely rounded, very convex above, covered with deep punctures, and having five elevated lines on each, which, however, are often scarcely observable: under side and legs black, slightly shining.

This insect, which is usually the largest of the genus, is not common in this quarter. It has occurred near the east end of the Pentland range, and near Coates.

G. Cápreæ.—Black beneath, griseous above and coarsely punctured, with the head and three spots on the thorax black. 2¼–2½.—*Fab.* *Gyllen.* *Chry. Capreæ, Linn.* *Crioc. Capreæ, Marsh.*

Somewhat oblong-ovate, widest behind the middle, glabrous: head black, coarsely punctured, with a channel in the centre: the antennæ black, with the four basal joints more or less griseous: thorax narrowly margined on the sides and behind, the surface very unequal, punctate, of a griseous colour, with three large indeterminate black spots: scutellum large and black: elytra dull testaceous, sometimes fuscescent, deeply and irregularly punctured: under side of the body and thighs black, pubescent, tibiæ and tarsi griseous.

Var. *b.* of Gyllenhal, which differs chiefly in being of a darker colour, with the spots on the thorax confluent, and the antennæ faintly griseous at the base, has been taken in this neighbourhood. It appears to be the *G. saturata* of Steph. Illus. iv. 288.

Not unfrequent in some seasons, in others rather scarce.

G. Nymphǽæ.—Oblong-ovate, black, the thorax yellow, with three black spots, the mouth, lateral margins of the elytra and legs yellow, the thighs black at the base. 2¼–2¾.—*Fab. Gyllen. Chry. Nymphea, Linn. Crioc. Nymphea, Marsh.*

Not so convex as the preceding, and more elongate; head yellow anteriorly, with a short groove between the antennæ, the mouth and vertex black, the latter finely rugose: antennæ black, the lower joints testaceous at the base, the 3d rather elongated: thorax testaceous-yellow, shining, with a large fovea on each side, and another, or two placed longitudinally, in the centre, the bottom of each black and punctured: elytra somewhat depressed above, brownish-black, thickly punctured, pubescent, the external margin yellow: under side of the body black, pubescent, the apex of the abdomen yellowish; legs yellow, the base and tip of the thighs blackish.

On marsh plants by the side of Duddingston Loch, in May and June. It has likewise been taken further to the south, but does not appear to be common in Scotland.

G. tenella is the only other species known to inhabit Scotland.

Genus—LUPÉRUS, *Geoffroy.* From λυπηρος, in reference either to the colour, or to some supposed noxious properties in the species.—Antennæ as long as the body in the female, longer in the male, slender and filiform, 11-jointed, the basal joint robust, the 2d and 3d short, the rest very long, subcylindric, the terminal one acute (Pl. II, f. 7.): palpi with the penultimate joint large, the terminal one small, conic: mandibles with the apex acute, and a small tooth just beneath it: head triangular: thorax transversely quadrate, the sides somewhat rounded: elytra ample, dilated posteriorly: tarsi 4-jointed, basal joint longest, 3d bilobed, the claws with a tooth near the base. —*Curtis, B. E.* viii. 370.

L. rúfipes.—Shining black, glabrous, base of the antennæ and the legs ochreous yellow, the base of the thighs black. 2–2½.—*Crioc. rufipes, Fab. Auch. rufipes, Marsh. Galeruca rufipes, Gyllen.*

Glossy black, or faintly bluish-black, glabrous; head with a transverse impressed line behind the antennæ; the latter black, with the three or four basal joints yellow: thorax margined on the sides, convex above, scarcely punctulated: elytra minutely and thickly punctured: under side of the body shining black; legs yellowish, the thighs dusky at the base.

Not very common. Rosslyn and woods on the banks of the Esk, occasional.

L. flávipes.—Glossy black, glabrous, the thorax, base of the antennæ, and legs yellow. 2.—*Chry. flavipes, Linn. Crioc. flavipes, Fab. Galeruca flavipes, Gyllen.*

Head glossy black, nearly smooth, with an impression on the forehead; antennæ black, several of the radical joints yellowish at the base: thorax wholly pale yellow, very glossy and scarcely punctured: elytra glossy black, glabrous, faintly but thickly punctured: abdomen black beneath; legs yellow, the thighs black at the base, especially the hinder pair.

Frequents the leaves of trees and herbaceous plants, seemingly most partial to the beech, alder, and hazel; not common. Shady wood on the side of the Esk, a little above Dalkeith. It occurs in Dumfries-shire.

GENUS—HÁLTICA, *Illig.*—Antennæ inserted between the eyes, slender, and shorter than the body, 11-jointed, the radical joint longest and most robust, the 2d and 3d shorter than the 4th, the remainder decreasing in length, terminal rather long and acute: body oblong, or oblong-ovate: head not concealed by the thorax; the latter transverse: hinder thighs much thickened, formed for leaping; tibiæ slender.

The species of this genus are of small dimensions, and occur in great numbers during the spring in humid places. They are very destructive to pot herbs and other garden produce, both in the larva and perfect state. The larvæ resemble those of Chrysomela and Crioceris, and some of them are remarkable for discharging an odorous and acid fluid from certain small tubercles on their backs. The nymphæ bear a likeness to those of Coccinella, and remain from fifteen to twenty days in that condition. The perfect insects are often highly adorned, and are sometimes known under the name of *garden fleas.* The species are extremely numerous, above 100 occurring in Great Britain alone.

A. *Thorax without a transverse impression behind.*

a. *Elytra irregularly punctured.*

H. némorum.—Oblong-ovate, black, thickly punctured, with a longitudinal yellowish stripe on each elytron, the base of the antennæ, tibiæ, and tarsi testaceous. 1–1½.—*Chry. nemorum, Linn. Crioc. nemorum, Fab.*

Glabrous, shining black, with a tinge of green, particularly on the elytra; the 2d and 3d joints of the antennæ, and the apex of the 1st, testaceous, the rest black: thorax with the sides rounded, and distinctly margined, slightly convex above, and rather deeply punctured: scutellum impunctate: elytra much wider than the thorax, moderately convex, thickly and irregularly punctured, each with a longitudinal pale yellow or sulphur coloured vitta, bent inwards posteriorly, and not reaching quite to the apex: under side of the body and thighs black; all the tibiæ and tarsi, and joints of the fore legs, testaceous.

Too plentiful in all parts of the country.

"The chief dependence," say Messrs Kirby and Spence, "of our farmers, for the sustenance of their cattle in the winter, is another most useful root, the turnip, and they have often to lament the distress occasioned by a failure in this crop, of which these minor animals are the cause. On its first coming up, as soon as the cotyledon leaves are unfolded, a whole host of little jumping beetles, composed chiefly of *Haltica nemorum,* called by farmers the *fly* and *black Jack,* attack and devour them, so that on account of their ravages the land is often obliged to be resown, and frequently with no better success. It has been calculated by an eminent agriculturist, that from this cause alone, the loss sustained in the turnip crops in Devonshire in 1786, was not less than £100,000[*]."

H. Pseudácori.—Ovate, convex, deep blue above, black beneath, the base of the antennæ rufescent. 1¼–1¾.—*Chry. Pseudacori, Marsh. H. cærulea, Ent. Hefte ?*

Shining and glabrous above, of a black blue colour, punctured, very minutely on the head and thorax; the former with a transverse triangular impression on the forehead, the latter convex, margined, with an elevated line in the centre posteriorly: elytra with larger punctures than the thorax, and generally of a brighter blue: under side of the body and legs black, with short scattered hairs: antennæ likewise black, the basal joints rufescent.

On the leaves of the Iris Pseudacorus at Dalmeny, in tolerable plenty.

H. tábida.—Oblong-ovate, convex, pale yellowish, the mouth, eyes, and apex of the antennæ black, the elytra thickly and irregularly punctured. 1¼–1½.—*Crioc. tabida, Fab. Chry. tabida, Marsh.*

Head shining, scarcely punctulated, with a small ridge between the antennæ; the mouth, eyes, and apex of the antennæ blackish: thorax margined on the sides, moderately convex, shining, with scarcely perceptible punctures: elytra much wider than the thorax, thickly and finely punctulated, pale, or somewhat yellowish: under side of the body and legs entirely pale testaceous.

Rather frequent in grass fields, &c.

H. atricílla.—Oblong-ovate, convex, pitchy-black, the thorax and anterior legs subtestaceous, elytra pale testaceous, with the suture black. 1–1¼.—*Chry. atricilla, Linn. Marsh.*

Head pitchy black, with a faint brassy lustre on the crown; antennæ testaceous at the base, the apex dusky: thorax narrowest in front, the sides much deflected and margined, convex, tinged with red, punctured, and faintly brassy: elytra convex and rather strongly punctured, pale yellowish, somewhat griseous, the suture black: under side of the body pitchy-black; legs pale, excepting the hinder thighs, and occasionally the hinder tibiæ, which are pitchy-black.

Not scarce in many places around Edinburgh.

H. ochroleúca.—Ovate, punctulated, pale, the mouth, eyes, and apex of the posterior thighs, black. 1.—*Chry. ochroleuca, Marsh.*

Entirely pale above, the head and thorax slightly tinged with yellow: the mouth and palpi, together with the eyes and apex of the antennæ, black: thorax glossy, with scarcely perceptible punctures: elytra very pale, thickly punctured: under side of the body and legs likewise pale, the breast rusty brown, and the apical half of the posterior thighs black.

In grassy places not scarce. Salisbury Craigs.

H. lúrida.—Ovate, convex, pitchy-black, the elytra brownish, thickly punctured, the base of the antennæ and the feet livid testaceous. 1.—*Gyllen. Steph.*

Head shining pitchy-black, obsoletely punctulated, with a small ridge between the antennæ; the base of the latter livid-testaceous, the apex fuscescent: thorax rounded on the sides and margined, coloured like the head, and thickly punctured: elytra with the apex of each rounded, very convex above, rather deeply punctured, of a brown colour, more or less deep, generally paler towards the apex; under side of the body pitchy black, legs livid-testaceous, the apex of the posterior thighs fuscescent.

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[*] *Introduction to Entomology*, vol. i. p. 185.

Fields near Craiglockhart and Slateford. "Cramond" *Steph. Illus.*

B. *Thorax with a transverse impression behind.*

b. *Elytra punctate-striate.*

H. ferrugínea.—Oblong-ovate, glabrous, pale ferruginous, with the eyes black, the elytra rather irregularly punctate-striate. 2.—*Chry. transversa, Marsh.*

Of a uniform ferruginous colour, with the eyes black, the surface nearly glabrous; antennæ paler than the body: thorax with a short impression near the hinder margin, and parallel with it: elytra not very regularly punctate-striate: under side and legs rather paler than the upper surface.

Frequent in waste places, among nettles, &c.

H. rúfipes.—Ovate, the head, thorax, antennæ and legs, rufous, elytra greenish-blue, punctate-striate, the breast and abdomen black. 1¾.—*Chry. rufipes, Linn. Crioc. ruficornis, Fab. Chry. ruficornis, Marsh. Don.*

Head and thorax rufous, glossy; the former with a short carinula between the antennæ, and two inconspicuous depressed tubercles; the eyes black: thorax margined on the sides, the disk rather convex, with scarcely perceptible punctures, having a wide transverse impression behind, bent backwards at each end to the margin: elytra greenish blue, punctate-striate, the stria next the suture abbreviated: breast and abdomen black, very minutely punctulated: legs red.

Rather plentiful about midsummer, on plants and among grass. Braid Burn. Salisbury Craigs, &c.

H. Hélxines.—Ovate, head and thorax coppery-green or golden, elytra regularly and deeply punctate-striate, the antennæ and legs testaceous-yellow. 1¾.—*Chry. Helxines, Linn. Fab. Chry. fulvicornis, Fab. Chry. aurata, Marsh.*

Head brassy-green, very minutely punctulated, and marked as in the preceding species; palpi and antennæ pale testaceous, the apex of the latter often dusky: thorax slightly convex, greenish copper or golden-green, with a bright metallic lustre, rather deeply punctate, and having a transverse impression behind, terminating at each end in a fovea: elytra deeply punctate-striate, of a green or brassy-green colour, sometimes blue or violaceous: under side of the body shining black, the breast glossed with green: legs pale testaceous, the hinder thighs dusky.

On umbelliferous plants in woods, particularly Angelica sylvestris. Woods near Rosslyn, not plentiful.

c. *Elytra irregularly punctured.*

H. olerácea.—Oblong-ovate, convex, bluish-green, the antennæ black. 1¾-2.—*Chry. oleracea, Linn. Galer. oleracea, Fab.*

Of a bluish-green colour, shining: head with a small ridge between the antennæ, the surface rather unequal and punctured; antennæ black, the radical joints the same colour as the body: thorax with the angles obtuse, the sides margined, the surface obsoletely punctured, the base with a long impressed line, rather deepened on each side behind: elytra green or bluish-green, minutely and irregularly punctulated: under side similar in colour to the upper surface, but less glossy, and having a few ashy hairs; legs bluish-green, the tarsi blackish.

On plants in gardens and fields, occasional.

H. Erúcæ.—Oblong-ovate, glossy-blue or violet-blue, the antennæ and tarsi black. 2¼.—*Chry. Erucæ, Marsh. Galer. Erucæ, Fab.*

Similar to the last in form, but usually of a larger size, glossy-blue, occasionally tinged with violet; thorax and elytra obsoletely and irregularly punctured: under side glossed with green; antennæ and legs black, the latter usually tinged with violet.

Cramond, and near Portobello.

SUBGENUS—MACROCNÉMA, *Megerle*. From *μακρος, large,* and *κνημη, the tibia*.—Antennæ 10-jointed, the 2d and 3d joints of nearly equal length, the 4th longer, the remainder decreasing in length: body rather elongate: tarsi inserted in the tibiæ at some distance from the apex: in other respects like Haltica.

M. Nápi.—Ovate, convex, the body and hinder thighs blue-black, base of the antennæ and legs pale testaceous, elytra punctate-striate, the interstices scarcely punctulated. 1¾.—*Chry. Napi, Fab. Haltica Napi, Gyllen.*

Mouth pitchy, the forehead punctured, antennæ testaceous, the apex more or less dusky: thorax rounded on the sides and margined, thickly, but not deeply punctate, often faintly tinged with green: elytra not much attenuated towards the apex, regularly punctate-striate, the stria next the suture diverging somewhat obliquely at the base, the space between it and the suture occupied by a short stria, the interstices obsoletely punctured: under side of the body and posterior thighs bluish-black, or black with a brassy tint: the anterior legs and posterior tibiæ, and tarsi, pale-testaceous.

Frequent during the spring months, on stones and walls in warm weather. Arthur's Seat. Ravelston, &c.

SUBGENUS—SPHÆRODÉRMA, *Steph.* From *σφαιρα, a sphere,* and *δερμα, the skin,* in allusion to the orbicular form of the species.—Antennæ 11-jointed, the 2d, 3d, and 4th joints from the base shortest, the 2d subglobose; body nearly hemispheric: tarsi short, the first or basal joint considerably dilated.

S. testácea.—Rufo-testaceous, glossy, the eyes black, finely and obsoletely punctured, thorax sinuated behind. 1½.—*Chry. testacea, Fab. Marsh.*

Resembles a Coccinella in form, being nearly hemispheric; of a uniform testaceous-red colour, the eyes alone black: head with a semicircular elevation on the crown, the surface very obscurely punctured; antennæ rather paler than the body: thorax widely emarginate in front, the base produced in the middle, with a sinuosity on each side, the surface very convex and obsoletely punctured: elytra rather more distinctly punctured than the thorax, the punctures scattered irregularly, very convex above, and glossy: under side likewise testaceous-red; legs rather paler, the tibiæ thickened at the apex.

Pretty frequent on plants, particularly the spear thistle; likewise on nettles and black knapweed (*Centaurea nigra*).

Besides the above, we have to mention the following species of Haltica as inhabiting Scotland:—H. suturalis, H. pallens, H. fuscescens, H. nigricans, H. hilaris, H. Holsatica, H. Chrysanthemi, H. Cardui, H. orbiculata, H. Modeeri, H. semiaenea, H. picicornis, H. anchusæ, H. rustica.

FAMILY—CHRYSOMELIDÆ.

WHEN Linnæus established his great genus Chrysomela, he included within its extended boundaries numerous groups which the more precise observation and more ample materials of later entomologists have caused to be erected into separate genera. It is thus that we owe *Erotylus, Colaspis,* and *Adorium* to Fabricius, *Eumolpus* to Kungelman, *Helodes* to Paykull, *Doryphora* to Illiger, and *Paropsis* to Olivier,—besides several others, to the origin of which we have already alluded in the preceding notices. The species of this family are among the most beautiful and richly adorned of all the insect tribes. Azure, green, and gold form their ordinary costume, and to that lustrous aspect, combined with their compact and rounded forms, they no doubt owe their title of *Chrysomela,* which in the Greek language, signifies an apple of gold. These insects are of small or medium size. Few of them measure more than half an inch in length, and the greater number do not equal that dimension. They are strictly herbivorous, and sometimes commit considerable ravages on agricultural and garden produce. The larvæ have in general six feet, an elongated body, beset with warts or tubercles, and terminated by a kind of nipple, which secretes a viscous fluid used both in walking and in order to fix the insect firmly before its conversion to the nympha state. Their transformations usually take place in the open air, in which case they are protected by the hardening of their natural envelope. Many of the species are gregarious, while others are solitary, and it is among the latter that such occur as undergo their metamorphoses under ground.

GENUS—CHRYSOMÉLA, *Linn.* Chrysomelum, from χρυσος, *gold,* and μῆλια, *an apple,* anciently denoted a kind of fruit with a yellow rind; and was thought by Linné sufficiently applicable to the insects of the present genus, in consequence of their globular shape and brilliancy of colouring; *Plin.*—Antennæ becoming gradually thicker to the apex, 11-jointed, the radical joint very thick, 2d shortest, 3d rather long and slender, the five last considerably thickened, the terminal one largest: maxillary palpi 4-jointed, the terminal joint dilated and securiform (Pl. II. fig. 8.): mandibles with two teeth at the apex: maxillæ divided into two lobes, of which the external one is broadest: body ovate, or oblong-ovate, very convex, furnished with wings: legs simple: tarsi 4-jointed, the penultimate joint bilobed.—*Curtis, B. E.* iii. 111.

A. *The punctures on the elytra arranged in rows.*

a. *Sides of the thorax not thickened.*

C. Litúra.—Short, ovate, testaceous or rufo-testaceous, the suture, a short line on each elytron, and the abdomen, black. 1¾-2¼.—*Chry. olivacea* and *stygia, Marsh.*

Body short, quadrate-ovate, pale brownish-yellow or rufo-testaceous: head punctate, the eyes and generally the posterior part black; tip of the antennæ rather dusky: thorax punctate, the punctures at the sides large and deep, generally with two black marks behind: elytra with punctured striæ, which, however, are often very irregular, particularly towards the apex, where the interstices are likewise punctured; the suture, and a longitudinal mark on each elytron, black: body beneath black: legs the colour of the body, the thighs dusky and punctured.

A very variable insect both in size and colour: it is often entirely testaceous, excepting the eyes and back part of the head: at other times it is entirely black, with the base of the antennæ and tarsi testaceous. In the latter state it appears to be the *Chry. rufitarsis* of Marsham.

Inhabits broom, and is very plentiful throughout the south of Scotland. Braid Hill. Corstorphine, &c.

C. decempunctáta.—Oblong-ovate, thorax and elytra rufous, spotted with black, abdomen and legs black. 3–3¼.—*Linn. Fab. Chry. viminalis, Panz.*

Head black, punctate; base of the antennæ testaceous, apex black: thorax and elytra rufous, the former deeply punctured on the sides, generally with a broad quadrate black mark behind; the latter rather faintly punctate-striate, the interstices punctulated, with five large irregular black spots on each, several of which, however, are usually obsolete; body beneath and legs black, punctate, apex of the abdomen and claws testaceous.

Rather scarce in this part of the island. It has occurred on the willow at Rosslyn, Lasswade, and several other places.

b. *Sides of the thorax thickened.*

C. marginâta.—Brownish-black, with a brassy lustre, the elytra margined with reddish-yellow. 2¼–3.—*Linn. Marsh.*

Head and thorax black or fuscous, with a brassy and sometimes a violaceous tint, minutely punctured, the latter with a longitudinal series of large punctures near the lateral margins, which are very slightly thickened: elytra with a reddish-yellow margin, punctate-striate, the sutural stria abbreviated, the rest rather irregularly disposed in pairs, the external rows not reaching quite to the base; the interstices punctulated: wings pale red: legs and under side of the body bluish-black: antennæ black, the basal joints faintly yellowish.

On hills and elevated pastures, not very scarce. Calton Hill. Arthur's Seat. Pentland Hills. April—June.

B. *Punctures on the elytra scattered irregularly.*

a. *Sides of the thorax not thickened.*

C. várians.—Ovate, convex, coppery or greenish-blue above, with the base of the antennæ of the same colour, elytra thickly and irregularly punctured. 2½–3.—*Fab. Chry. Marshami, Don. Chry. viridiænea, Marsh.*

Ovate, colour of the upper surface very variable, but most commonly greenish copper, frequently blue, sometimes bluish-black; head very faintly punctulated, with an arcuate line anteriorly; eyes and apex of the antennæ black, the base of the latter and the palpi the colour of the head: thorax punctulated, the punctures larger and somewhat confluent towards the basal angles: elytra closely punctate, the punctures larger than those on the head and thorax; wings whitish, with brown nervures: body beneath blue-black, legs generally of the same colour as the upper surface.

Woods, occasional, on different species of *Hypericum*, St John's Wort, especially the *H. perfoliatum* and *H. hirsutum.* Banks of the Water of

Leith below the aqueduct at Slateford, plentiful in some seasons in September and October.

C. fastuósa.—Ovate, brilliant golden-green, the suture and a stripe along each elytron violet-blue. 2¼-3.—*Chrys. fastuosa, Linn. Don. Marsh.*

Upper surface brilliant golden-green, with bluish reflections; head punctured on the sides, the forehead with a shallow groove; antennæ brownish and pubescent, the base ferruginous: thorax rounded on the sides and narrowly margined, the base very indistinctly sinuated, the disk minutely punctured, the sides more deeply: elytra closely and distinctly punctured, the punctures having a tendency to run in lines near the sides; the suture, and a streak along the middle of each elytron, bluish-violet; under side and legs brassy-green, the tarsi somewhat obscure and furnished with ashy hairs beneath.

This beautiful and somewhat local species occurs in great plenty on the Lamium album, White Dead-nettle, at the base of Salisbury Craigs: also near Cramond, and in a lane leading from Manor-Place to the Water of Leith. It begins to appear early in May.

C. haemóptera.—Somewhat gibbous, bluish-black, base of the antennæ pitchy-red, the punctures on the elytra forming broken irregular striæ. 3–3¾.—*Linn. Marsh. Chry. Hottentotta, Fab.*

Ovate, somewhat gibbous, widest just behind the shoulders: entirely bluish-black, except the base of the antennæ which is pitchy-red: head and thorax obsoletely punctulated, the latter with a faint oblong impression near the basal angles: elytra with large punctures, placed very irregularly, leaving considerable spaces smooth, and having a tendency to run into striæ, particularly towards the outer margin, where there is frequently a stria perfectly formed: under side of the body and legs similar in colour to the upper surface, the tarsi with dense ash-coloured hairs.

Not common. Arthur's Seat.

C. goettingénsis.—Short ovate, wholly violaceous, the base of the antennæ, palpi, and tarsi testaceous. 3½–4¼.—*Linn. Marsh.*

Short and wide, of a uniform violet colour, with a tendency to purple, the palpi and base of the antennæ testaceous: head and thorax very finely punctured, the latter emarginate in front, the base faintly sinuated, the punctures becoming rather larger towards the sides: elytra very convex, the punctures with which the surface is thickly covered occasionally disposed in irregular series, the spaces between minutely punctulated: under side and legs violaceous; the tip of the tibiæ and the tarsi testaceous.

Rare: specimens have occurred to Sir P. Walker, near Coates.

b. *Sides of the thorax thickened.*

C. staphyléa.—Ovate, testaceous-brown above with a brassy lustre, paler beneath, elytra irregularly and rather finely punctured. 3–4.—*Linn. Marsh.*

Upper surface of a uniform testaceous-brown colour with a faint metallic lustre, the under side, legs, and antennæ, of a paler hue: head and thorax very minutely punctulated, the former with an arcuate line between the antennæ, and a very faint longitudinal one rising from the apex of the arc; the latter with the sides much thickened: elytra very convex, irregularly covered with not very large punctures, the lateral margins inflected.

On hedge banks, under stones, &c. frequent in all parts of the southern division of Scotland.

C. políta.—Oblong-ovate, shining golden green, elytra testaceous-brown, irregularly punctate. 3–4 : 2–2¾.—*Linn. Marsh.*

Head and thorax green or bluish-green, glossed with gold, and highly polished, the punctures minute, except towards the sides of the thorax which are rather ruggedly punctate, the margin elevated and smooth : scutellum the colour of the thorax : elytra testaceous-brown, covered with irregular punctures : under side of the body and legs green, shining : antennæ black, generally with the basal joints more or less ferruginous.

Weedy places, grassy banks, &c. frequent. Fields at Duddingston. Banks of Water of Leith below Saughton Hall. It was very abundant in this situation in the summer of 1829 on the Glechoma hederacea, ground Ivy.

The *only* other species of Chrysomela, properly so called, which have been found in Scotland, are C. Hyperici and C. sanguinolenta, the former occurring in some plenty near Minto, Roxburghshire, the latter on the mountains near Moffat, where it was observed by Mr Wm. Little.

SUBGENUS—**PHÁEDON**, *Megerle.* Maxillary palpi with the terminal joint very little thicker than the others, somewhat conic or obtuse : the mandibles with four teeth at the apex (in some of the species).

P. Bétulæ.—Ovate, convex, violaceous above, black beneath, head and thorax punctulated, elytra punctate-striate. 1½.—*Chry. Betulæ, Linn. Marsh.*

Small, ovate, convex, violaceous or dark blue, shining : head and thorax very finely and rather thickly punctulated, the front and sides of the latter margined : elytra with faint lines composed of small punctures, the interstices flat and smooth : under side of the body, legs, and antennæ black.

Pretty frequent among herbage, generally in watery places.

P. tumídula.—Ovate, brassy black, shining, thorax with the disk impunctate, the sides rather tumid ; elytra punctate-striate. 1½–2.—*Steph. Chry. tumidula, Kirby.*

Generally larger than the preceding, ovate, black with a brassy lustre : head punctulated, with a smooth arcuate line between the antennæ, the latter black with the basal joint obscurely rufescent : thorax rather depressed and unequal in the centre, the sides slightly elevated, generally with a few pretty large punctures, the disk impunctate : elytra with punctured striæ, the sutural stria abbreviated : under side of the body punctulated ; legs bronzed black.

Occurs in considerable plenty among grass. Water of Leith and elsewhere in May and June.

P. marginélla.—Oblong-ovate, blue-black above, the thorax and elytra margined with yellow. 1¾–2 : 1.—*Steph. Chry. marginella, Linn.*

Convex, very glossy, bluish-black above, sometimes greenish ; head punctate, with an impression between the antennæ, the latter black, the lower joints bronzed : thorax broad, convex, covered with large punctures, the sides yellow : elytra very little wider than the thorax, also margined with yellow, punctate-striate, the interstices impunctate, except that next the outer margin, which has a row of remote punctures : under side of the body and legs blue-black, the former punctate.

On the flowers of the Ranunculus acris, Upright Meadow Crowfoot, not unfrequent. Margin of Duddingston Loch. Meadows, &c.

P. Vitellínæ.—Oblong-ovate, brassy or blue-black, elytra finely punctate-striate, the punctures placed irregularly at the sides, the apex of the abdomen with a yellow margin. 1¾–2.—*Steph. Chry. Vitellinæ, Linn. Marsh. Galeruca Vitellinæ, Fab. Chry. vulgatissima, Linn. Marsh.*

Brassy, with a greenish tinge, or blue-black, shining: head and thorax punctured: antennæ black, the basal joints more or less ferruginous: elytra wider than the thorax, the shoulders somewhat prominent, with punctured striæ, which are rather irregular at the outer margin: under side and legs dull brassy, with a faint tinge of green, the abdomen usually with a very narrow testaceous margin at the apex.

On willow and poplar trees, abundant throughout the south of Scotland.

P. Polýgoni.—Oblong-ovate, dark blue or violaceous, thorax and legs rufous, tarsi black. 2.—*Chrys. Polygoni, Linn. Marsh. Don.* iii. pl. 96. f. 1.

The whole upper surface thickly and irregularly punctured: head greenish-blue; antennæ black, the basal joints piceous: thorax shining red, convex: elytra convex, dark blue or violaceous, often tinged with green, the punctures having a tendency to run into striæ, particularly at the outer margin: body beneath blue-black, the apex of the abdomen rufous: legs rufous, tarsi black.

Frequents the Polygonum aviculare, knot-grass, occurring pretty frequently, seemingly throughout the kingdom.

P. Rháphani.—Oblong-ovate, above glossy-green, thickly and irregularly punctate, blue-black beneath, forehead with a shallow groove. 2–2½. *Chry. Rhaphani, Fab. Gyllen. Chry. Hypochæridis, Marsh.*

The whole upper surface green or bluish-green, with a faint golden lustre: head with an arcuate impression between the antennæ, and a longitudinal line on the crown; apex of the antennæ fuscous, pubescent, the base glossed with green: scutellum often margined with blue: elytra wider than the thorax, and rather more deeply punctate: under side of the body blue-black, or greenish; legs glossed with green; tarsi blackish, claws piceous.

On the large leaved docks, abundant in some places. East end of Duddingston. Shore at Figget Whins.

SUBGENUS — MELASÓMA, *Dillwyn.* From *μελας, black,* and *σωμα, the body.*—Antennæ short, rather compressed, 11-jointed, the 5 upper joints gradually increasing in diameter, and transverse, except the terminal one, which is ovate and pointed: palpi with the terminal joint small and obtuse: thorax short and narrow.

M. Pópuli.—Blackish-blue, elytra rufous, with the apex black. 4¾–5½. —*Steph. Chry. Populi, Linn. Fab.*

The largest of the Chrysomelidæ hitherto observed in Scotland: head black-blue, the surface rather unequal, minutely punctured, and having an impression down the middle, and another across the front; antennæ black: thorax the colour of the head, small, the sides slightly thickened and narrowly margined, the front emarginate, the centre very smooth and glossy, the sides thickly punctured, and having an impressed line on each side at some distance from the margin: scutellum blue-black: elytra very large, much widened behind, deep red or ferruginous, minutely and irregularly punctured, the apex with a narrow patch of black: under side blue, inclining to black; the legs of the same colour.

On each of the nine intermediate dorsal segments of the body of the larva of this species, there is a pair of black elevated conical tubercles, of a hard substance, from all of which, when touched, it emits a small drop of a white milky fluid, the smell of which, according to De Geer, is almost insupportable, being inexpressibly strong and penetrating. These drops proceed at the same instant from all the eighteen scent organs, which forms a singular spectacle. The precious fluid, however, is by no means wasted when exercised, for each drop, after a momentary appearance, during which it dispenses its perfume, is withdrawn within its receptacle, till again required *.

Scarce: Inhabits Poplar and Willow trees. Rosslyn. Hawthornden.

M. aénea.—Brassy-green above, thickly punctulated, dull brassy-green beneath, the apex of the abdomen rufescent. 2½–3.—*Steph. Chrys. aenea, Linn. Fab. Marsh.*

Upper surface entirely brassy-green, not unfrequently with a slight golden reflection, the under side of a similar colour, but much more obscure: head marked nearly as in the preceding species; antennæ reddish at the base, the rest black: thorax with the sides a little rounded and narrowly margined, but scarcely thickened, having an obsolete longitudinal impression remote from the margin; the surface thickly punctured throughout: elytra very glossy, closely covered with irregular punctures: margins of the abdomen rufescent; legs brassy-green.

Scarce near Edinburgh, although occurring in some plenty in many parts of the south of Scotland. Cramond.

GENUS—HELÓDES, *Payk.* From ελωδης, *a marsh*, the species usually frequenting such places.—Antennæ about the length of the thorax, 11-jointed, the radical joint long and clavate, 2–6 slender, nodose, the remaining five forming a long club, all the joints of which are semiglobose, except the terminal one, which is larger: palpi thickened in the middle, the terminal joint short, ovate, the maxillary pair scarcely the length of the maxillæ: body elongate, nearly linear, depressed: thorax quadrate: legs short: tarsi slender.—*Lat. Gen.* iii. 59.

Paykull instituted this little genus, which, although admitted by Fabricius and Olivier, and also recognised by Latreille, has been named *Prasocuris* by the last named author. We know little of the transformations of these insects, which are but few in number. In the larva state they inhabit the interior of the stalks of aquatic plants, on the leaves of which the perfect insects also feed.

H. Phellándrii.—Dark-brassy, shining, lateral margins of the thorax, and two longitudinal bands on each elytron, yellow. 2–2½.—*Chry. Phellandrii, Linn. Prasocuris Phellandrii, Lat.*

Dark brassy, with a slight greenish tinge; head punctate, with a small impression; antennæ black, the basal joints bronzed: thorax very irregularly punctured, the sides yellow: elytra very little wider than the thorax, punctate-striate, having two yellow longitudinal bands on each, one at the external margin, the other on the disk, which are united at the apex: under side of the body and legs bronzed; the margin of the apical segment of the abdomen, base of the thighs, and greater part of the tibiæ, yellow.

On aquatic plants, frequent. Braid marshes. Duddingston Loch. Lochend.

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* De Geer, t. v., p. 291. *Introduction to Entomology*, vol. ii. p. 246.

H. Beccabúngæ.—Dark blue or greenish-blue, elytra finely punctate-striate, apex of the abdomen rufescent. 2–2½.—*Chry. Beccabungæ, Marsh. Hel. violacea, Fab.*

Entirely dark blue, greenish, or violaceous; head punctate, with an arcuate impression anteriorly: thorax flatter than in the preceding species, more finely and thickly punctured: elytra wider than the thorax, with ten finely punctured striæ on each, and an abbreviated one beside the scutellum; apical segment of the abdomen margined with rufous: legs sometimes tinted with brassy or green.

Not so common as the preceding; found on the Veronica Beccabungæ, and other aquatic and marsh plants. Braid Burn. Ditches at the west end of Duddingston Loch.

GENUS—CRYPTOCÉPHALUS, *Geoffroy*. From κρυπτος, *concealed*, and κεφαλη, *the head*, which is inconspicuous and partially retractile within the thorax.—Antennæ filiform, almost as long as the body, 11-jointed, the radical joint long and clavate, 2d nearly globose, 3 following slender, the remainder more robust and of equal length: palpi short, the terminal joint conic-cylindric, truncate at the apex: mandibles strongly bidentate at the apex: head vertical, inserted into the thorax as far as the eyes: thorax nearly globose, almost as wide as the elytra: tibiæ without spines; tarsi 4-jointed, the penultimate one bilobed.—*Curtis, B. E.* i. 35.

C. Linéola.—Shining black, elytra rufous, with a black margin, and a broad longitudinal streak of the same colour on the disk of each. 2½–3. *Crio. lineola, Fab.*

Head black, punctate, with a small impression on the crown: antennæ black, more or less rufescent at the base: thorax and scutellum black, very smooth and glossy, impunctate: elytra punctate-striate, the striæ next the suture placed somewhat obliquely; rufous, narrowly margined on all sides with black, each having a longitudinal patch of black on the disk: under side of the body and legs black.

Not common in Scotland; a few specimens have been taken on Arthur's Seat, and in some other places. C. sexpunctatus has been found at Rae-hills, Dumfries-shire.

FAMILY—CASSIDIDÆ.

GENUS—CÁSSIDA, *Linn.* TORTOISE BEETLE.—Antennæ subclavate, 11-jointed, the basal joint longest and clavate, 2d globose, the 3 following rather slender, the remainder gradually increasing in size, the terminal one conic (Pl. II. f. 9.): palpi robust, with the terminal joint somewhat elongate-conic: mandibles with 3 teeth at the apex: thorax generally semicircular: elytra shield-shaped, considerably larger than the abdomen: legs short: tibiæ without spines; tarsi 4-jointed, 2d and 3d joints bilobed, the lobes of the latter as long as the unguicular joint.—*Curtis, B. E.* iii, 127.

The name of Cassida, which signifies a helmet, was no doubt bestowed upon the insects of this genus, on account of a strongly marked character in their structure. The edges of the thorax and elytra overlap and protect the limbs and abdomen on all sides, and the head is also nearly covered and concealed by the prothorax. Many of the species are highly ornamental, and present pleasing combinations of green and golden hues, which, however, soon disappear or diminish in intensity after the death of the insect, but may be temporarily restored by the use of hot water. These insects are herbivorous in their habits, and are fond of artichokes and thistles. The structure and habits of the larvæ are rather singular, and have been studied and described by Goedart, Roesel, Reaumur and De Geer. They are flattish, rather broad, and beset laterally by sixteen branched spines placed horizontally on each side of the posterior and superior portion of the body. At the base of these spines may be observed seven small cylindrical truncated tunnels, each placed on a distinct segment: these are probably the stigmatic openings. The head is small, of a corneous consistence, and presents four small tubercles on each side of its superior part, and only three on its inferior. These are regarded by De Geer as genuine eyes. Six scaly feet, terminated by a brown coloured hook, sustain the body, which is terminated by a two-branched fork, curved over the back, and usually bearing a pile of excrementitious matter, under which the larva lies in part concealed. It can elevate or depress this " stercorareous parasol" at pleasure, for the varying purposes of shade or shelter. The nymph is shorter than the larva, broad, flattened, of an oval form, and surrounded by peculiar appendages. It has an ample thorax, terminated by a circular arch, and furnished with similar points or appendages. The legs and the segments of the abdomen are perceptible. It was in the aspect of one of these nymphæ that Goedart supposed he recognised a representation of the human figure surmounted by an imperial crown. The genus Cassida presents an immense amount of species. About 20 are indigenous to Britain, several more occur on the Continent of Europe, and, including exotic species, De Jean enumerates 103 as the amount (in 1821) of his collection.

C. equéstris.—Short ovate, green above, and thickly punctured, black beneath, with the margin of the abdomen and the legs pale yellowish. 4.—*Fab. Lat. Gyllen. C. viridis, Illig. Marsh.*

Head black, minutely punctured; antennæ likewise black, the base testaceous: thorax short, the front and hinder angles rounded, thickly punctured, the punctures obsolete on the disk: elytra with the shoulders produced and rounded, the sides and apex rounded, the disk deep green, thickly and irregularly punctured, the dilated margin pale green: breast and abdomen black, the sides of the latter and the legs yellowish, with a ferruginous tinge.

Inhabits various kinds of mint, and other labiate plants, occurring not unfrequently. Fields at Corstorphine, &c.

C. rubiginósa.—Ovate, dull green above, elytra irregularly punctate-striate, somewhat rufescent at the base, legs pale, thighs black, with the apex pale. 2¾–3¾ : 2–2¼.—*Illig. Gyllen. C. similis, Marsh.*

Ovate, pale green above; thorax thickly punctate, semicircular, the hinder angles acute: elytra somewhat rufescent along the basal suture, the part covering the abdomen convex, with rather large punctures, arranged in irregular broken lines, and bounded externally by a row of larger punctures, beyond which the margin is flat and irregularly punctured: under side of the body shining black, lateral margins of the abdomen sometimes pale: legs pale, thighs black, with a pale apex: antennæ pale, the apex dusky.

On thistles and other plants, occasional.

C. obsoléta.—Ovate, greyish-yellow above, under side black, margins of the abdomen and legs pale testaceous, elytra deeply punctate-striate, the alternate interstices slightly elevated. 2–2¼.—*Illig.* *Gyllen.*

Scarcely more than half the size of the preceding species: forehead pale; the eyes blackish-brown; antennæ pale, dusky at the tip: thorax pale, convex behind, where there is an impression, the middle nearly smooth, the sides much depressed, and thickly punctured: elytra pale greyish, very convex in the middle, with deep striæ composed of rounded punctures, which have a slightly raised centre, the alternate interstices rather convex, the sides depressed and very irregularly punctured: under side black, the margin of the abdomen and the legs pale testaceous.

Inhabits plants, and is not very scarce. Cramond, Dalkeith, &c.

SUBSECTION—TRIMERA.

FAMILY—COCCINELLIDÆ.

Genus—COCCINÉLLA.—Antennæ shorter than the thorax, slightly clavate, 11-jointed, the basal joint robust, curved, 2d ovate, 3–8 short cylindric, and rather slender, the rest thickening to the apex, and forming an obconic, compressed club: maxillary palpi long, very robust, the terminal joint securiform; labial with the terminal joint elongate-ovate: thorax transverse, the hinder edge rounded, the angles acute: elytra hemispherical, very narrowly margined: legs short: tarsi apparently 3-jointed.—*Lat.* iii. 74. *Curtis, B. E.* v. 208.

This genus was established by Frisch, and has been adopted by all succeeding entomologists. It serves, according to Mr Curtis, as a remarkable example of the value of structure in the combination of groups, and of the slight importance of the distribution of colour, when employed to distinguish species. "As a genus, *Coccinella* is so natural that its appellation has never been disturbed; whereas the species composing it are so variable, that many of them have been described under a great variety of names *." These insects are distinguishable from the neighbouring genera of *Chrysomela* and *Erotylus* by the number of articulations of the tarsi, which never exceed three distinct joints. In this character they so far coincide with *Eumorpha*, *Endomychus* and *Dasycerus;* but from those genera they differ in the shortness of their antennæ, the form of their bodies, and the development of the last articulation of the maxillary palpi. The general form of these beautiful, and, for the most part, familiarly known insects, is hemispherical, an aspect produced chiefly by the convex shape of the elytra. The under surface is extremely flat, the legs are short, and, except when the insect is in motion, scarcely project beyond the lateral edges of the elytra. Leon Dufour has illustrated the anatomical structure of this genus with his accustomed accuracy. He discovered in *C. septempunctata* a salivary apparatus composed of three pair of diaphanous vessels, of extreme tenuity, more or less twisted, and stretch-ing from the hinder part of the mouth into the abdomen, where the extremities appear to float. He was, however, unable to detect the appearance of any gland, or other organ of an essentially secreting nature; but when submitted to a powerful microscope, these vessels exhibited a structure entirely analogous to that of the salivary conduits observable in the dipterous and hemipterous tribes. A linear and tubular axis was perceptible through their pellucid coats, resembling that of the excrementitial secretions of the *Carabidæ*. The digestive canal is itself scarcely longer than the body of the insect, and is consequently nearly straight. The œsophagus seems inclosed in the head, in such a way that, to render it observable, the alimentary tube must be drawn backwards. The stomach is not preceded by any crop or gizzard. It is bilobed at its origin, where it approaches the head, and receives the œsophagus into the notch or slope produced by that bilobation. It is longer than the rest of the tube, is very smooth and dilatable, and was found filled sometimes with a blackish, sometimes with a yellowish pulp. Near its termination were the biliary vessels, six in number. These vessels are somewhat large in proportion to the size of the insect, and each has a distinct and isolated insertion on the stomach as well as on the cæcum. They have a very varicose aspect, and have always appeared diaphanous. The insertion of these biliary vessels indicates the limits of the stomach, and we have then a very short intestine, followed by a slightly bulged cæcum, and a rectum distinctly marked.

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* *British Entomology*, vol. v. p. 208.

The larvæ of the *Coccinellæ* feed on Aphides, and are extremely useful in the destruction of these noxious insects, which abound to the deterioration of so many valuable plants. In the perfect state, many of the species pass the winter in the clefts of palings, and the chinks of walls. Their eggs are usually laid in spring. These are of a yellow colour, with a disagreeable smell, and produce larvæ of an aspect very different from that of the perfect insect. In that early condition, the body is much broader than deep, and is pointed towards the extremity, which bears a fleshy projection carried by the insect on the plane of its position, and serving as a kind of supernumerary foot. The body consists of twelve rings or segments, which, in some cases, are garnished with spines or tubercles, in others smooth. When the larvæ have attained to their full size, they adhere by their hinder extremity to a leaf or a stone, and partly freeing themselves from a slough or skin, they assume the state of chrysalis. In the course of a week or two according to the species, the perfect insect makes its appearance. It is at first soft, flexible, and almost colourless; but a very short period suffices to adorn it with those gay and contrasted markings which render the *Coccinellæ* or "Lady-birds" among the most admired of all the smaller tribes of coleopterous insects. Some contrariety of opinion appears to exist in regard to the food and habits of these insects in the perfect state. Perhaps their instincts may vary according to circumstances, or may present a disparity in the species. We have frequently observed them preying upon aphides; and yet Bosc, in describing the *Coccinella borealis* of America, mentions its destructive attacks upon the leaves of the melon plantations; and other species are said to be injurious to the crops of lucerne and cinqfoil. Their numbers vary greatly in different years. In 1807, as Messrs Kirby and Spence inform us, the shore at Brighton and all the watering-places on the south coast were literally covered with them, to the great surprise and even alarm of the inhabitants, who were ignorant that these little visitors were merely emigrants from the neighbouring hop-grounds, where, in their larva state, they had slain their thousands and their tens of thousands of the Aphis, which, under the name of the *Fly*, so frequently blasts the hop-grower's prospects [*]. Mr Stephens enumerates thirty British species of this genus, almost every one of which exhibits several striking varieties [†].

C. septempunctáta.—Black, with a yellowish spot on each of the anterior angles of the thorax, elytra red, with seven black spots. 3½–4: 2½–3.—*Linn. Fab. Oliv. Don.* ii. pl. 39. f. 5.

Hemispheric, thickly and minutely punctulated throughout; head slightly pubescent anteriorly, black, with two small yellowish-white spots between the eyes; antennæ ferruginous, the basal joint and apex dusky: thorax glabrous, shining black, each of the anterior angles with a large quadrate patch of yellowish-white: scutellum black: elytra rufous, yellowish-white on each side of the scutellum, and having a large common black spot just behind it, with three others of a similar description on each elytron, placed in the form of a triangle, with the apex towards the suture: under side of the body and legs black, with short pale pubescence: the anterior part of the breast with a yellowish-white patch on each side.

The varieties of this species are pretty numerous, but none of them are of frequent occurrence in this neighbourhood.

Common almost everywhere in spring and summer. It sometimes survives the winter, and re-appears about the middle of February.

C. quinquepunctáta.—Black, with a yellow spot on each of the anterior angles of the thorax, elytra red, with five black spots. 2–2¾.—*Linn. Fab. Oliv. Gyllen.*

Considerably less than the preceding; head similar, the edge of the upper lip pale; antennæ ferruginous, the radical joint blackish, the apex dusky: thorax and scutellum as in the last species: elytra thickly punctured, of a blood-red colour, with a common black spot behind the scutellum, another near the middle of each elytron, and a third, of smaller size, behind the middle, near the lateral margin: under side and legs black.

On flowers, trees, &c. common over all the country.

C. undecimpunctáta.—Black, with a yellow spot on each of the anterior angles of the thorax, elytra rufous, spotted with black. 2–2¼.—*Linn. Gyllen.* &c.

Head with two minute yellowish spots between the eyes; thorax with a quadrate patch of the same colour on each of the anterior angles: elytra red, with a common rounded black spot behind the scutellum, and five others on each elytron; one near the shoulder, and four further back, placed in pairs somewhat obliquely: under side of the body and legs black, the breast anteriorly with a yellowish mark on each side.

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[*] *Introd. to Entomology,* vol. i. p. 257.

[†] The natural union of these apparently distinct kinds may have given rise to the belief that different species of *Coccinellæ* cohabited with each other. "On trouve quelquefois," says Latreille, "des individus tres differents par leurs coleurs accouplés; mais on n'a pas suivi les résultats de ce mélange."—*Regne Animal,* tom. v. p. 162.

Of pretty frequent occurrence. This insect is very variable in the number of spots on the elytra: they are sometimes united in pairs, and the humeral spot is occasionally awanting, as well as the enlarged one behind the scutellum.

C. oblongo-guttáta.—Testaceous-red, the lateral margins of the thorax, and lines and spots on the elytra, whitish. 3–3¾.—*Linn. Fab. Oliv. Gyllen.*

Subhemispheric, punctulated: head more or less whitish on the crown; the antennæ ferruginous, with the apex fuscescent: thorax with a brownish-testaceous space in the centre, frequently bounded on each side by an oblique black line, the lateral margins whitish: elytra rufo-testaceous, with a narrow exterior line, two oblong spots on the back, the anterior frequently divided, and another on each side of the scutellum, yellowish-white; the suture likewise whitish: under side of the body reddish-brown, the legs paler.

Found in fir-woods, occasionally. Corstorphine Hill. Dreghorn. In Roxburghshire we have frequently observed it on the broom.

C. sedecimguttáta.—Testaceous-yellow, somewhat pellucid, elytra rather broadly margined, and marked with sixteen white spots. 2½–3.—*Linn. Fab. Gyllen.*

Entirely pale testaceous-yellow, rather soft and pellucid, punctulated, the eyes black: thorax glossy, the sides dilated and pellucid-white: elytra with eight rounded white spots on each, five forming a row near the suture, the apical one rather obsolete, and three others towards the lateral margins: under side of the body and legs testaceous-yellow.

In shady woods and coppices, occasional. On the hazel at Rosslyn, and about Cramond.

C. quatuordecimguttáta.—Rufo-testaceous, with a white lunule near each of the hinder angles of the thorax, and fourteen spots of the same colour on the elytra. 2–2¾.—*Linn. Fab. Don.*

Head and thorax testaceous or rufous the latter more or less distinctly margined on the sides with white, which is dilated near the posterior angles into a lunulated spot, the disk rarely with two dark spots: elytra rufo-testaceous, finely punctulated, each with seven white spots, occasionally surrounded with fuscous, one on the scutellar angle, three placed transversely, two behind the middle, and one within the apex: under side of the body piceous in the middle: legs rufo-testaceous.

Occasional. Collington woods. Water of Leith above Slateford, &c.

C. octodecimguttáta.—Rufo-ferruginous, the thorax with two yellowish spots before the scutellum, and nine others of the same colour on each elytron, the two basal ones crescent-shaped. 2–2¼.—*Linn.*

Somewhat oblong, ferruginous, punctulated: head with two yellowish spots between the eyes: thorax with the lateral margins and two dorsal spots behind, which are sometimes confluent, yellowish: elytra each with two large crescent-shaped yellowish spots at the base, one of them on the scutellar angle, the other on the shoulder, a third of a rounded form in the centre behind them, three placed transversely, two behind the middle, and one at the apex: under side of the body dusky in the centre, the sides of the breast yellow: legs testaceous.

Craiglockhart, Collington, Rosslyn, &c.

C. tredecimpunctáta.—Oblong, black, thorax yellow on the front and sides, the latter with a black spot on each, elytra red, spotted with black, tibiæ and tarsi testaceous. 2½–3.—*Linn. Fab. Marsh. Gyllen.*

Narrower than most other species, somewhat oblong; head black behind, the anterior part yellow; antennæ testaceous, with the apex dusky: thorax narrowly margined on the front, and widely on the sides, with yellow, the disk and a spot on each side black: elytra oblong-ovate, of a reddish or yellowish colour, generally having a common black spot on the suture at the base, and six others on each elytron: under side black, the sides of the abdomen yellowish; legs yellowish, with black thighs.

The spots on the elytra sometimes unite and form bands: the basal spot on the suture is occasionally wanting; and the surface is at times altogether without spots.

In woods and fields, not very frequent.

C. novemdecimpunctáta.—Oblong, sulphur-yellow above, the thorax marked with six black spots, and the elytra with nineteen. 1¾–2.—*Linn. Fab. Marsh. Gyllen.*

Upper surface sulphur-yellow; head blackish on the crown, especially at the sides; antennæ ferruginous: thorax closely punctured, and marked with six black spots, of which the four in the centre form a quadrangle: scutellum black: elytra more distinctly punctured than the thorax, having a common oblong black spot at the base of the suture, and nine others on each: under side black, margined with yellow; legs entirely of the latter colour.

Not common. Near Coates, and in some other places to the west of Edinburgh.

C. vigintiduo-punctáta.—Light-yellow, the thorax with five black spots, and the elytra with eleven on each. 1¾.—*Linn. Gyllen.*

Fine sulphur-yellow, glossy: head sometimes with a few minute black spots; antennæ testaceous: thorax with five black spots: scutellum black: elytra very convex, and thickly punctured, having eleven rounded black spots on each: under side pitch-black, the margins more or less yellowish; legs testaceous, the thighs somewhat dusky in the middle.

The spots on the thorax and elytra are often united.

This beautiful species is not common in Scotland. It is usually found among nettles, and other plants in waste places. Near Coates.

C. Reppénsis.—Black, with the sides of the thorax and a spot towards the apex of the elytra rufous. 1½–1¾.—*Herbst. Gyllen. Steph.*

Black, punctulated; the head occasionally rufescent: thorax with the sides more or less widely rufous, and the anterior margin narrowly edged with reddish-yellow: elytra shining black, scarcely margined, with a red spot more or less distinct within the apex: under side of the body black, or piceous; legs black, with the tarsi and anterior tibiæ testaceous.

Said by Mr Stephens to have been taken at Cramond. We have not met with the insect ourselves.

C. impustuláta.—Ovate-hemispheric, black, the elytra rather widely margined. 1¾–2. *Illig. Gyllen.*

Head punctured, entirely black, or pale with a black line across the crown: antennæ pale, with the apex dusky: thorax punctured, black, each of the anterior angles with a white spot: elytra black, sometimes with the lateral margins, and a spot on the shoulder, reddish: under side black, the breast with a triangular spot of white on each side: legs black, the tarsi inclining to ferruginous.

The elytra have sometimes three rufescent spots, and occasionally five on each.

Far from common: on plants by the side of the Esk, near Dalkeith.

C. díspar.—Ovate, hemispheric, black, elytra narrowly margined, their surface variously marked with red. 2–2½.—*Illig. Steph. Coc. bipunctata, Gyllen.*

Head punctured, black, with an oblong whitish spot near each eye, which is sometimes nearly obliterated; antennæ ferruginous, more or less dusky towards the tip: thorax widely margined with white on the sides, and narrowly on the front, the centre black, the hinder part occasionally with a lobed spot of white: elytra more distinctly punctured than the thorax, coloured with black and red in a very variable manner; under side and legs black, the tarsi with ferruginous sponge beneath.

The variations in the markings of this species are very numerous; the elytra are sometimes reddish-yellow, with a black spot in the middle of each; in this state it is the *C. bipunctata, Linn.* At other times the elytra are black, with six red spots on their surface when united, forming *C. sexpustulata, Linn.;* or with four red spots, a state in which it was named *C. quadripustulata, Linn.* It is sometimes found with only one red spot on the shoulder, and numerous other modifications are frequent.

C. variábilis.—Subhemispheric, rather widely margined, elytra with a transverse elevated line within the apex, legs generally reddish. 2–2½.—*Illig. Gyllen. Steph.*

Head usually of a pale colour; antennæ of a similar hue, the apex dusky: thorax generally pale, often more or less spotted with black: scutellum black: elytra with a transverse, slightly arched, elevated line, a little distant from the apex, the colour of the surface very variable: under side black, the edges of the abdomen reddish: legs yellowish, inclining to red, the thighs usually obscure.

Var. *a.* Elytra yellowish, unspotted, the thorax with several dusky or black spots.

Var. *b.* Elytra with a black spot on each.

Var. *c.* Elytra with from two to six black spots.

Var. *d.* Spots on the elytra united.

Frequent in fields and woods in most parts of the country.

C. duodecimpunctata, C. humeralis, C. hyperborea, C. conglomerata, and C. quatuordecimpustulata, are the other kinds indigenous to Scotland.

SUBGENUS—CHILÓCORUS, *Leach.* Probably from χιλοω, *to devour,* and κορυς, *a bug,* the species feeding on aphides.—Antennæ short: palpi with the terminal joint truncated obliquely: thorax very short, margined, the hinder angles rounded: elytra with a wide margin.

C. renipustulátus.—Black, with the abdomen beneath, and a transverse ovate spot in the middle of each elytron, red. 2.—*Coc. renipustulata, Illig. Gyllen. Coc. Cacti, Marsh.*

Black, punctured and shining; antennæ pale: thorax nearly semicircular behind, the sides produced anteriorly on each side of the head, convex in the middle, the edges dilated: elytra large, dilated on the sides, very convex above, approaching to gibbous; glabrous and of a shining black colour, with a rather large transverse spot of red near the middle of each elytron: under side reddish, rather pale; legs black.

Not a common species, but it has been found on several occasions in this neighbourhood.

C. bipustulátus.—Black, with the head, margins of the abdomen, and a band on each elytron formed of confluent spots, red. 1¾.—*Coc. bipustulata, Linn. Marsh. Gyllen.*

Generally less than the preceding species; head and antennæ reddish-brown: thorax shining black: elytra likewise black, with an abbreviated band of red across each, formed by the junction of three spots, of which that next the outer margin is separated from the others: abdomen black, with the edges reddish; legs black.

Not very frequent, but occurring at times in woods and on wall tops, &c. Craiglockhart.

C. 4-verrucatus, " Kinordy, Forfarshire," *Misses Lyell.*

SUBGENUS—SCÝMNUS, *Herbst.*—Antennæ short and slender, the apex rather abruptly clavate: palpi as in Coccinella: thorax transverse, the hinder part as wide as the elytra, to which it is closely applied: body nearly hemispheric, and covered more or less thickly with hairs: thighs rather thickened.

S. discóideus.—Somewhat ovate, black, elytra rufous, with the base and outer margin black. ¾.—*Steph. Coc. discoidea, Fab. Gyllen.*

Slightly pubescent; head minutely punctured, black, with the mouth and antennæ testaceous: thorax generally black, very convex and punctulated: elytra ovate, narrowly margined on the sides, of a reddish colour, with the base and outer margin black, to a greater or less extent: under side black; legs testaceous, the thighs usually black.

Frequents fir trees, and is not rare in many parts of the country. Swanston, Dalmeny, &c.

S. Litúra.—Testaceous-red, the eyes and abdomen black, elytra fuscous, with a black band. 1.—*Rhyzobius Litura, Steph. Der. coadunatus, Marsh.*

Shining testaceous-red, with very fine thinly scattered hairs; antennæ rather long and robust; thorax usually unspotted, but sometimes having a dusky mark in the centre: elytra irregularly punctured, sometimes unspotted, at other times with a band of black behind the middle: under side black: legs testaceous.

Not unfrequent among moss, at the roots of grass, under stones, &c. Figget Whins, and other places along the coast. Salisbury Craigs.

GENUS—CACÍCULA, *Megerle.*—Antennæ the length of the thorax, clavate, 1st joint long, robust, 2d short, robust, the 3 following slender and somewhat elongated, the 3d being longest, next 3 oval, the 3 terminal joints forming a pilose club: maxillary palpi with the terminal joint large, and obliquely truncated; labial with the terminal joint ovate-conic: head trigonate: thorax transverse, the sides rounded: elytra ovate: tibiæ simple; all the tarsi 3-jointed, the penultimate joint bilobed.—*Curtis, B. E.* iii. 144.

C. pectorális.—Oblong, rose-red, elytra irregularly punctate-striate, unspotted, breast and base of the abdomen black. 1–1¼.—*Chry. pectoralis, Fab. Silpha rosea, Marsh.*

Oblong-ovate, pale vermilion above, with soft short hairs: eyes black: head and thorax closely punctured: elytra usually of a brighter red than the thorax, also closely punctate, with a few larger punctures arranged in irregular striæ: breast and abdomen black, the apex of the latter and the legs rufous.

At the roots of grass in marshes, and at the sides of ponds. Figget Whins. Duddingston Loch, &c.

SECTION—VI.

FAMILY—TENEBRIONIDÆ.

GENUS—**TENÉBRIO**, *Linn.* The name is applied with reference to the habits of the species, being derived from *tenebræ*, and properly signifies one who hates the light.—Antennæ inserted under the margin of the head, about the length of the thorax, filiform, 11-jointed, the radical joint elongate-oval, 2d rather shortest, 3d longest, 4th rather longer than the following, which are somewhat pear-shaped and truncated, terminal nearly globose (Pl. II. fig. 10.): maxillary palpus long, 4-jointed, 2d joint longest, terminal nearly hatchet-shaped; labial with the terminal joint elongate-ovate, truncate: head nearly orbicular: thorax subquadrate, as wide as the elytra behind, or nearly so: anterior thighs thickened; tarsi of the anterior and middle legs 5-jointed, the unguicular joint nearly as long as the other four; hinder tarsi 4-jointed, the 1st and unguicular joints of equal length.

Linnæus and other authors of the earlier era of the modern school, combined under the name of Tenebrio (so called from their obscure haunts) an extensive group of insects which it has since been found necessary to subdivide into many genera. Hence have arisen Blaps, Helops, Pimelia, Erodius, Scaurus, Sepidium, and, more recently, many others.

T. Molítor.—Pitch-black above, somewhat shining, ferruginous beneath, the anterior thighs short and thick. 6–7.—*Linn. Marsh*, &c. *Samou. Comp.* pl. iv. f. 1.

Upper surface pitch-black, slightly shining, and thickly covered with very minute punctures: head rounded, rather depressed and unequal, the mouth dull reddish: antennæ pitch-black: thorax nearly quadrate, a little narrowed in front where it is pretty deeply emarginate, the sides a little rounded and margined, the angles rather acute; near the base on each side there is an oblong impression placed obliquely: elytra scarcely wider than the thorax, rounded at the apex, obsoletely striated with very minute punctures, the interstices finely punctulated: under side and legs glossy ferruginous, likewise thickly punctulated; the anterior thighs short, thick, and compressed; the anterior tibiæ curved.

The larva of this species is commonly known under the name of meal worm. It is long, cylindrical, of an ochry yellow, very smooth and shining, with short legs. It forms the favourite food of nightingales in the domestic state, and assumes the form of nympha in the midst of the meal or flour on which it feeds. The perfect insects are found in bake-houses and flour-mills, as well as occasionally among the fields, in old walls, and the less frequented parts of our habitations. Like many other nocturnal creatures, they are frequently attracted by strong light. We may add, in regard to the larvæ, that they have been found to inhabit the human stomach and intestines. How they contrive to get there it would be difficult to say, and that they should be able to sustain the heat of their new habitation is still more surprising. The fact, however, is undoubted.

T. obscúrus.—Dull black above, pitchy beneath, the anterior thighs long and very slightly thickened. 6.—*Fab.* *Curtis, B. E.* vii. 331.

"Dull black, minutely and thickly punctured. Antennæ and palpi castaneous, especially the four terminal joints of the latter. Thorax as long as it is broad, convex, ovate-truncate, broadest at the base, posterior angles slightly acuminated, a transverse channel at the base, terminated on each side, before the apex, by a short impressed line. Elytra elliptical, with a faintly punctured and abbreviated stria next the scutellum, the eight others continued to the apex, the interstices with an obscure row of tubercles down the middle of each. Legs and under side subcastaneous, the tarsi brighter."—*Curtis. l. c.*

This species is said by Mr Stephens to have been found at Edinburgh by Dr Leach.

FAMILY—BLAPSIDÆ.

This family forms the second tribe of Melasoma of Latreille, and receives its name from the genus Blaps of Fabricius. According to Dufour, the crop is less developed than in the Pimeliariæ of Lat., and the small valve at which it terminates posteriorly, is not formed of those corneous or connivent pieces of which it is composed in that tribe, but rather by an approximation of its interior fleshy columns. The chylific ventricle is also proportionably longer, and the spermatic capsules less numerous. The Blapsidæ are also said to be provided with a double excrementitious secreting apparatus, of a totally different structure from that of the Pentamerous tribes. It consists of two tolerably large oblong bladders situated beneath the viscera of digestion and generation, placed close to each other, with extremely thin parietes, and surrounded by more or less turgid adhering vascular folds, of which the point of insertion is difficult to ascertain, owing to the difficulty with which they are unrolled. A similar remark applies to the canals by which the secreted liquor is evacuated, for they are concealed by a kind of membranous diaphragm, fixed by means of a fleshy panicle on the last ventral segment. The secreted liquid issues laterally, and not from the extremity of the last segment; it is of a brown colour, acrid and irritating, of a peculiar and penetrating odour, and is ejected to the distance of eight or nine inches *. It is stated by Fabricius, in relation to *Blaps sulcata,* that the Turkish women inhabiting Egypt, where that species is very common, eat it cooked with butter, with a view to fatten themselves. He also informs us that it is used as a remedy for headach and the sting of scorpions. We have only three British species.

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* *Regne Animal,* t. v. p. 14.

GENUS—BLAPS, *Fab.* Probably from βλαπτω, *I injure*,—some of them being superstitiously considered as prognosticating evil.—Antennæ nearly filiform, 1st joint pear-shaped, 2d very short cup-shaped, 3d much the longest, 4 following equal, obconic, the rest globose, the last with the apex acute (Pl. II. fig. 11.): palpi 3-jointed; maxillary with the basal joint longest, clavate, 2d shorter, clavate, 3d broad, compressed, triangular; labial with the last joint likewise triangular: mandibles broad, bifid at the apex: thorax nearly quadrate, the sides a little rounded anteriorly: elytra united at the suture, embracing the abdomen, the apex narrowed into a projecting point: legs long, tibiæ with two spines at the apex: 4 anterior tarsi 5-jointed, posterior pair 4-jointed.—*Latr.* ii. 161. *Curtis, B. E.* iv. 148.

B. mortisága.—Rather dull black, thorax nearly quadrate, flat and punctulated, elytra faintly punctulated and produced behind into a narrow point. 7½–10.—*Tenebrio mortisagus, Linn.*

Rather dull black: head rounded, minutely punctured, the upper lip ciliated with ochreous hairs; antennæ black: thorax nearly quadrate, the sides rounded anteriorly and margined, the disk flat, punctulated, rather unequal, with a very obsolete dorsal line: elytra ovate, depressed on the back, irregularly punctulated, the apex produced into a bifid point, from which an elevated line extends to the shoulder, the portion beneath which is thinly punctulated, inflected, and embraces the abdomen: segments of the abdomen wrinkled at the sides, more or less punctulated in the middle: legs long and black; the thighs scarcely clavate.

Occurs in cellars, outhouses, &c. not unfrequent.

This is the species of beetle which was kept alive by Mr Baker for three years. It lay submerged for a whole night in spirits of wine, and revived next morning apparently refreshed. With the exception of *Dytiscus marginalis*, kept in captivity by Esper, and the rose-beetle (*Cetonia aurata*) of Roesel, we are not aware of any other insect having attained to so great an age[*]. It is recommended by Pliny to be applied along with oil of cedar as a cure for otherwise inveterate ulcers.

FAMILY—HELOPIDÆ.

GENUS—HÉLOPS, *Fabricius.* The name of a fish among the ancients, celebrated on account of its delicate flavour; *Colum.* lib. viii. c. 16. *Plin.* lib. ix. c. 17.—Antennæ nearly filiform, the length of the head and thorax, 11-jointed, 1st joint rather robust, 2d shortest, 3d much the longest, the remainder longer than the 1st and obovate, terminal oval: maxillary palpi 4-jointed, 2d joint long and clavate, 3d short, 4th large, compressed, triangular (Pl. II. fig. 12.); labial with the terminal joint rather large, the apex rounded and spongy: mandibles with the apex acute and slightly bifid: thorax subquadrate, very convex: elytra convex, oval: 4 anterior tarsi 5-jointed, the unguicular joint longest; posterior pair 4-jointed, the radical joint longest. —*Latr.* ii. 185. *Curtis, B. E.* vii. 298.

The insects of this genus were confounded with Tenebrio, till Fabricius effected their separation under the name of Helops. They live beneath the bark and in the fissures both of dead and living trees. The habits of *H. ater* have been studied by M. Guerin during the summer

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[*] We mean in the perfect state, for the larvæ of various kinds live as long as the periods above mentioned.

season on a wooden bridge of L'Isle Louviers. They seemed extremely lethargic during the day, but about nine in the evening they leave their retreats, and march about with great vivacity,—the males pursuing the females. By ten o'clock, however, they were all observed to enter their little dens in the chinks of the rails and pillars of the bridge. Such of the larvæ as are known are smooth, lengthened, cylindrical, with short legs, and a body composed of twelve segments, of which the last is terminated by two raised points; the head is as broad as the body, is furnished with a clypeus which covers the mouth, and bears on each side a small antenna directed forwards. The mouth is armed with strong maxillæ. The eyes are not apparent. These larvæ are found in old wood, tan, &c.

H. cœrúleus.—Blackish-blue above, black beneath, thickly punctured throughout, elytra punctate-striate. 8–9.—*Fab.* *Blaps violacea, Marsh.* *Teneb. chalybeus, Linn.*

Upper surface shining blackish-blue: antennæ black, the apex inclining to pitchy: head and thorax very thickly punctured, the latter with elevated margins, the under part narrow: elytra pretty deeply punctate-striate, the interstices thickly and minutely punctured: under side and legs black, not tinted with blue, the tarsi reddish beneath.

Occurs in fields and woods, sometimes under the bark of decayed trees, but is not common.

H. carabóides.—Brownish-black above, tinted with brass, pitch-red beneath, antennæ and legs pitchy. 4–5.—*Blaps Spartii, Marsh.* *Tenebrio caraboides, Panz.* *Gyllen.*

Elongate-ovate, piceous, somewhat bronzed: head and thorax thickly and finely punctured, the latter very convex, subquadrate, narrowest in front, the sides rounded, without a dorsal line, the posterior margin with two very faint impressions: elytra scarcely wider than the thorax, convex, the apex acute, with eight punctured striæ on each, and a short punctate line on each side of the scutellum, the interstices flat and punctulated, the 3d, 5th and 7th, rather widest: body beneath pitchy-ferruginous; tarsi, antennæ, and palpi, dull ferruginous: four anterior tarsi with the joints dilated.

This species has been taken by the side of the Esk near Dalkeith, and in other places, but not very frequently. It is much more plentiful further to the south.

Genus — CISTÉLA, *Fab.*—Antennæ more than half the length of the body, filiform, the 2d joint very short, the rest generally elongate, somewhat obconic, the terminal one rather slender: maxillary palpi long, robust, the terminal joint triangular, compressed and somewhat acuminated: mandibles with the apex entire: head projecting: thorax nearly semicircular, the hinder margin being straight, the front narrowed, and the anterior angles rounded: elytra large: legs long, the claws furnished with small teeth beneath.—*Lat.* ii. 225.

The present genus was established by Fabricius, and is composed of species formerly confounded with Tenebrio, Mordella, Chrysomela, and others. The same name was applied by Geoffroy to the genus Byrrhus of Linn. We are not acquainted with the habits of the larvæ, or the nature of their transformations, with the exception of those of *C. ceramboides*, described by Olivier, Vol. iii. No. 54, p. 5. Britain produces only four or five species, exclusive of such as fall under the genus *Allecula*, which was formed through a dismemberment of Cistela by Fabricius and Paykull.

C. murína.—Black, coriaceous above and pubescent, the elytra lurid testaceous, very obsoletely striated, the base of the antennæ and legs testaceous-yellow. 2¾ : 1¼–1½.—*Chry. murina, Linn. Crioc. murina, Marsh.*

Head fuscous-black, the mouth produced and testaceous; antennæ testaceous at the base, the apex fuscous: thorax the colour of the head, clothed with fine pubescence, the lateral margins occasionally ferruginous: elytra ample, convex, of a lurid-testaceous colour, somewhat shining, the striæ so obsolete as to be scarcely perceptible, except towards the suture: under side of the body shining black; the legs pale testaceous.

It occurs not unfrequently with the mouth and elytra fuscous black, and the antennæ fuscescent at the base, a state in which it has been described as a distinct species under the name *C. fusca, Marsh. Steph. Illus.* v. 30.

In hedges and in woods, not very uncommon. Near Duddingston, Corstorphine Hill, &c.

FAMILY—MELANDRYIDÆ.

GENUS—MELÁNDRYA, *Fabricius.* From μελανδϱυον, a word which occurs in Theophras. His. Plant. (l. 1. 5. c. 9.), and is usually translated *medulla quercus.* It was probably applied to this genus, because the species are sometimes found in the interior of trees.—Antennæ filiform, short, 1st joint larger than the 3d, 2d shortest, the rest obconic, shortening towards the apex, terminal ovate: maxillary palpi very long and conspicuous, 4-jointed, 1st joint short and slender, 2d long, robust, obconic, 3d shorter, 4th large, elongate, somewhat triangular and concave internally (Pl. II. f. 13.); labial short, the terminal joint longest, a little dilated at the apex: mandibles broad at the base, the apex acute, having a square notch on the internal margin: head nutant: thorax flat, nearly as broad as the elytra behind, narrowed in front, posterior margin sinuated: 4 anterior tarsi 5-jointed, posterior pair 4-jointed, with the basal joint very long, the penultimate bilobed in all.—*Lat.* ii. 190. *Curtis, B. E.* iv. 155.

These insects occur in wood. They conceal themselves beneath the bark of trees, more especially in those spots where some decomposition is taking place. As the genus is now constituted, there seem to be only three species of Melandrya, two of which occur in Britain.

M. carabóides.—Black, elytra blue-black, slightly furrowed, the thorax with a small oblong fovea on each side at the base. 5–6.—*Chry. caraboides, Linn. Crioceris caraboides, Marsh.*

Body bluish-black, shining, punctate and depressed, covered with a short black pubescence; widest behind the middle, and narrowing gradually towards the head, the latter depressed on the forehead; mouth pitchy; antennæ black, the tip of the terminal joint ferruginous: thorax black, with an impression on each side behind: elytra black-blue, depressed before the middle, finely punctulated, with shallow furrows and slightly elevated ridges between them, which are not quite parallel with the suture, but run somewhat obliquely towards the shoulder; body beneath and legs black, trochanters and terminal joints of the tarsi ferruginous.

Not common. It is not a rare insect in England, where, according to Mr Curtis, it is commonly found under the bark of decaying trees from April to June. Woods about Arniston and near Musselburgh.

FAMILY—MORDELLIDÆ.

GENUS—ANÁSPIS, *Geoffroy*—Antennæ gradually a little thickened towards the apex, the lower joints subcylindric, the upper obconic, slightly compressed, the terminal ovate: maxillary palpi long, the terminal joint securiform; labial short: mandibles with the apex acute, bidentate: head rounded, deflexed: thorax narrowest in front, the hinder margin straight, or faintly bisinuated: scutellum distinct: elytra scarcely wider than the thorax, long, nearly linear, arched: hinder legs longest, the four anterior tarsi with the penultimate joint bilobed, claws without teeth beneath.—*Lat.* ii. 210.

The species of this genus are small insects, usually found about midsummer on umbelliferous flowers. They are rather of a soft consistence, the body considerably arched lengthwise, and the surface covered with very fine silky hairs, which vary slightly in colour, according to the direction in which they are viewed. Eighteen species inhabit Britain.

A. ruficóllis.—Fuscous-black, with the mouth, base of the antennæ, and legs yellow, thorax reddish-yellow. 1½.—*Mordella ruficollis, Olivier. Marsh.*

Clothed with very short brownish pubescence, and marked transversely with very fine lines; head black, the anterior part and the palpi yellowish; antennæ fuscous, yellow at the base: thorax yellow or reddish-yellow: elytra long, linear, entirely black, somewhat silky: under side of the body black shining, the apex of the abdomen, in one of the sexes, with a short furcate appendage: legs yellow, the apex of the tibiæ and of the tarsal joints dusky.

On umbelliferous plants, particularly those of the genus Chærophyllum. Woods at Dalkeith. Banks of the Esk above Musselburgh.

A. obscúra.—Testaceous-yellow, the under side of the body, eyes, and apex of the antennæ black, the elytra marked with three dusky spots, the hinder one common. 1¼-1¾.—*Mordella obscura, Marsh. Anaspis melanopa, Steph.*

About the size of the preceding, testaceous-yellow, with very fine pubescence; eyes and apex of the antennæ black: thorax faintly bisinuated at the base, the disk sometimes with an obsolete fuscous mark: elytra somewhat fuscescent towards the scutellum, each with a fuscous spot variable in size and shape, near the middle, and a common one near the apex: breast and abdomen black shining, the legs pale testaceous.

With the preceding, but considerably more plentiful.

A. nigricóllis.—Brownish-black, elytra testaceous, with the apex, a band across the middle, and the suture black. 1½.—*Mordella nigricollis, Marsh. Anaspis fasciata, Steph.*

Nearly the size of the preceding, of a brownish-black colour, clothed with fine silky pubescence; mouth testaceous, base of the antennæ the same colour, the apex dusky: thorax entirely black, the pubescence of a light brown in certain lights: elytra yellowish, the suture, a band across the middle, and the apex, dusky black; legs fuscous.

Occurs along with the foregoing species, but is not so common as either of them.

A. frontalis has been found in various parts of the south of Scotland, but no where in plenty.

Genus—MORDÉLLA, *Linn.*—Antennæ filiform, somewhat serrated from the middle to the apex, the two radical joints subcylindric, nearly equal in length, 3d, 4th, and 5th obconic, the latter rather largest, the 5 following compressed, somewhat 3-angled, the internal angle produced into a minute tooth, the terminal joint narrow and acutely ovate: maxillary palpi with the terminal joint large and securiform: eyes not emarginate: thorax somewhat lobed behind: scutellum obvious: elytra covering the wings, which are plicate at the apex: abdomen terminating behind in a narrow filiform process, which projects considerably: 4 anterior legs as if inserted beneath the head; hinder thighs long and robust; the tarsi with the joints undivided.—*Lat.* ii. 208.

In the earlier editions of the *Systema Naturæ*, Linnæus included under the name of Mordella many insects belonging to other genera, such as *Anaspis*, *Haltica*, &c. At an after period he presented the genus in a more natural state, corresponding to the tribe of *Mordellones* of Latreille. The Mordellæ are lively and active little insects, occurring most commonly on flowers, and when seized, frequently slipping through the fingers, or suddenly availing themselves of the slightest relaxation of the grasp, to make their escape by launching into the air.

M. aculeáta.—Black, covered with silky pubescence, thorax transverse, antennæ rather deeply serrated. 2.—*Linn.* *Olivier.* *Marsh.*

Body entirely black, rendered rather dull by a covering of fine silken dusky-grey hairs; medial joints of the maxillary palpi, and occasionally a small portion of the base of the antennæ, reddish: thorax transverse, rather widest behind, the basal line slightly bisinuated: elytra wider at the base than at the apex, impressed with a single stria towards the suture: pubescence on the under side of a silvery hue, the process projecting from behind nearly as long as the thorax; legs black, a portion of the anterior thighs sometimes reddish.

Frequents the flowers of the hawthorn and other plants, but seems to be very scarce throughout Scotland. The only specimens which we have seen from this neighbourhood were taken near Rosslyn.

FAMILY—CANTHARIDÆ.

Genus—MÉLOE, *Linn.*—Oil-Beetle. Probably from μελας, *black*, that being the prevailing hue of the species.—Antennæ inserted before the eyes, longer than the head and thorax, incrassated or filiform, frequently distorted in the males, 11-jointed, the 1st and 3d joints nearly equal, ovate, the 2d small, globose, terminal joint elongate-conic, the intermediate ones variable in form (Pl. II. fig. 14.): palpi with the terminal joint thickened, the apex generally somewhat truncate: head vertical, wider than the thorax, to which it is united by a narrow neck: thorax small, somewhat quadrate: elytra soft, flexible, generally shorter than the abdomen, diverging widely towards the apex, one lying over the other at the base: legs long, each tarsus terminating in four claws.—*Latr.* ii. 216. *Curtis*, *B. E.* vi. 279.

This genus seems characteristic of the European continent and islands. Eight or nine species occur in Britain; and of the twenty-one species enumerated in De Jean's Catalogue, the whole are European. Mr Kirby, however, possesses a specimen taken in North America by Professor Peck. They are all characterized by dark and obscure colours, heavy and inelegant forms, and the want of wings. When seized, a yellowish oily liquor exudes from the joints of their limbs. They are most frequent in spring and autumn, and occur in fields and pathways, preferring, it is said, a sandy soil, and a sunny situation. They are used in Spain in common with Cantharides, and for the same medicinal purposes. The females, when filled with eggs, become greatly dilated, and much exceed the size of the males. An individual of the former sex observed by Goëdart, and which he fed with the leaves of Anemone and Ranunculus, laid 2212 eggs between the 12th of May and the 12th of June, without counting apparently as many more which were thrown aside. It effected this laying at two separate periods, placing the extremity of its abdomen in a hole which it had formed in the earth, and depositing the eggs in packets. These are of a yellowish colour, and resemble grains of sand pressed together. The larvæ are long, cylindrical, garnished with scattered hairs, composed of eleven nearly equal segments, besides the head, which is oval, and provided with two eyes, and a pair of longish antennæ. They have six legs, of rather large size compared with the length of the body, which is terminated by two long bristle-like appendices. These larvæ are supposed by some ingenious observers to be parasitical on the bodies of winged insects. De Geer having remarked that a strong resemblance existed between the larvæ of *Meloë* and a small insect which he found adhering to *Eristalis intricaria*, he placed two domestic flies among the former, and found that they were speedily adhered to by the larvæ, which stuck to them pertinaciously, and caused their death in two or three days. Bees are also subject to their attacks; and MM. Lepelletier and Serville are said to have recently confirmed the observations of De Geer, by breeding these parasites from the eggs of *Meloë*. On the other hand, says Mr Curtis, " Mr Kirby is disposed to think that his *Pediculus Melittæ* (*P. Apis*, Linn. ?) is not the larva of *Meloe;* and M. Leon Dufour has even formed them into a *genus*, under the name of *Triungularis andrenetarum;* and a figure of one is given in the 13th vol. of the " Annales des Sciences Naturelles [*]." M. Latreille also contests the opinion of their parasitical nature; and the facts, so far as known, are well stated by M. Walkenaer, in his *Mémoires pour servir à l'Histoire Naturelle des Halictes* [†]. The digestive system of the genus *Meloe*, with other anatomical details, has been illustrated by M. Dufour [‡]; and a monograph of the British species, by Dr Leach, will be found in the 11th volume of the *Linn. Trans.*

M. proscarabáeus.—Black, with the sides of the thorax, the legs and antennæ violaceous, the elytra rugose. 5-14.—*Linn.*, &c. *Proscarabæus vulgaris*, *Steph.*

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[*] *British Entomology*, vol. vi. fol. 279.

[†] See also *Introduction to Entomology* vol. iv. p. 225.

[‡] *Ann. des Sciences Nat.* t. iii. p. 486.

Soft, glabrous, somewhat shining: head large, vertical, or deflexed, coarsely punctured, the forehead with a narrow central line, the sides violaceous: antennæ violaceous, punctate, thickened in the middle, the 6th joint in the male large, compressed, the 7th incurved, the four apical joints dull black in both sexes: thorax narrowest behind, nearly flat above, punctate, the sides deflexed and of a bright violet colour: elytra greatly wider than the thorax, somewhat shining, convex, rugose, embracing the abdomen and overlapping at the base, the apex of each rounded and diverging: abdomen finely rugose, oblong, black, very large and ventricose in the female, the sides reflexed, the terminal segment small, violaceous: under side of the body black, rugose; legs punctured, pubescent, bright violet, sometimes approaching to coppery; each of the claws bifid, making four on each foot.

Borders of fields, gardens, road-sides, &c. occasional. It was remarkably abundant in the Botanic Garden in the spring of 1829. Canaan Lane. Water of Leith about St Bernard's Well. April—May.

FAMILY—NOTOXIDÆ.

GENUS—ANTHICUS, *Fab.*—Antennæ rather short, thickening a little towards the apex, 11-jointed, the radical joint rather large, 2d small and nearly globose, the remainder somewhat conic, the 3d being rather longest and the terminal one ovate: maxillary palpi with the terminal joint dilated and hatchet-shaped: head wider than the thorax, to which it is united by a narrow neck: thorax nearly heart-shaped: elytra covering the abdomen, wider than the thorax: legs long and slender, the four anterior tarsi 5-jointed, the hinder pair 4-jointed, the penultimate joint slightly divided.

A. fúscus. — Shining-ferruginous, punctured, elytra brownish-black, with the base obscurely ferruginous. 1¼.—*Steph. Lytta fusca, Marsh.*

Upper surface shining, punctured, and sparingly pubescent; head brownish-ferruginous, the antennæ of a similar colour: thorax ferruginous, nearly heart-shaped, being widest anteriorly and narrowed behind: elytra obscurely ferruginous across the base, the rest brownish-black, nearly free from pubescence, and rather deeply punctured: under side brownish-black; legs dull ferruginous.

Not unfrequent about Edinburgh in farm-yards, fields, &c.

SECTION VII.—BRACHELYTRA.

Our present subsection (composed of the great Linnæan genus *Staphylinus*) corresponds to the second family of the Pentamerous Coleoptera of Latreille, and to *Microptera* of Gravenhorst. Ancient writers appear to have bestowed the name of *Staphylinus* on certain species, which, from the characters assigned them, and their reported injurious effects on horses, we can scarcely refer to any of the modern genera of brachelytrous insects. Mouffet, however, having satisfied himself that some ancient passage did apply with sufficient correctness, made use of the term *Staphylinus*, in relation to the present group; and whatever may have been its original application, its meaning is now no longer ambiguous in the modern systems. The *genus*, as constituted by Linnæus, was first dismembered by Fabricius of two of its component groups, under the generic names of *Pæderus* and *Oxyporus*, and in still more recent times, numerous other subdivisions have taken place, which have raised the original genus to the rank of an ordinal section or comprehensive family.

Some writers regard the *Staphylini* as forming the passage from the Coleoptera in general to the Forficulæ or Earwigs, which compose the first genus of the *Orthopterous* order. In their habits, they somewhat resemble the *Silphæ* and *Necrophori*. They have usually a large flattened head, strong mandibles, short antennæ, and a thorax as wide as the abdomen, which is long, narrow, and generally depressed. The elytra are very short and truncated, although they still suffice to cover the long membranous wings, which, when not in use, are compactly folded. The upper portion of the segments of the abdomen being exposed, in consequence of the shortness of the elytra, are, contrary to the usual rule among the coleopterous tribes, of as firm a consistence as that beneath. From the terminal segment of the abdomen two vesicles are protruded or retracted at the pleasure of the animal; and from these, when irritated, a subtile vapour makes its escape, with a strong odour of sulphuric ether. "Though most of the micropterous species," Mr Kirby observes, "have a fetid smell, yet there are some exceptions to this amongst them. One species (*S. suaveolens*, K., MS.) related to *S. micans*, Grav. which I once took, smelt precisely like a fine high-scented pear; another, *Oxytelus morsitans*, like the water-lily; a third, *O. rugosus*, like water-cresses; and lastly, a fourth (*S. fuscipes*) like saffron." M. Leon Dufour has described the apparatus by which these odours are produced in the 8th vol. of the *Annales des Sciences Naturelles*. The insects of this section, when attacked or touched, elevate the extremity of their abdomen, bend it in various directions, and frequently protrude the vesicles above alluded to. They also use the point of the abdomen to close or unfold their wings. The tarsi of the two anterior legs are frequently broad and dilated, and the coxæ are very large. The species usually occur in damp places, under stones, in earth and excrementitious matters. Some live in mushrooms and fungi, or in rotten wood; while a few of the smaller species are found on flowers. They are all swift, active, and voracious.

The larvæ bear a close resemblance to the perfect insect. In figure, they more nearly resemble an elongated cone, the base of which is formed by the head; the terminal segment is prolonged into a tube, and is accompanied by two conical and hairy appendages. Their food and habits of life are very similar to those of the imago.

According to M. Dufour, the only essential difference between the alimentary canal of the brachelytrous tribes and that of the carnivorous coleoptera, consists in the absence of the crop. The first stomach is small, and destitute of folds; the second is very long and pilose; the intestine is extremely short. The biliary vessels are inserted at the same lateral point as in the Carnivora, and present, in some species, near the middle, a knot or vesicle, not observable in any other insects. Their sexual apparatus differs greatly from that of the carnivorous Coleoptera *.

Many of the species of this section are of minute dimensions, and a knowledge of their names and characters is of difficult attainment. Many more of the described species than have been hitherto collected no doubt exist in Scotland; and there is every reason to believe that an assiduous entomologist would reap a rich harvest among a tribe which seem characteristic of temperate or even northern countries. Notwithstanding the obscurity in which many of our smaller species are still involved, Great Britain already possesses between 700 and 800 recorded species of brachelytrous insects; while the last edition of De Jean's Catalogue (1833), containing both European and exotic kinds, gives only 789.

FAMILY—STAPHYLINIDÆ.

Genus—CREÓPHILUS, *Kirby*. Named from *κρεας*, *flesh*, and *φιλος*, *a lover*, the species frequenting carcasses.—Antennæ not longer than the head, clavate, pilose, subgeniculated, 1st joint long, robust, obconic, 2d and 3d short, obconic, three following equal, globose, the remaining five forming a club, of which the joints are transverse, terminal subovate, with the apex compressed and somewhat emarginate: maxillary palpi with the 2d and 3d joints nearly of equal length, clavate, the 4th, or terminal, more slender, fusiform truncate; labial with the 3d or terminal joint longest, truncate: mandibles with the apex acute, and a triangular elevation near the middle, the apex of which is bidentate: head as broad as the thorax; the latter semicircular and glabrous: anterior tarsi dilated.—*Steph. Illus.* v. 202.

C. maxillósus.—Black, shining, elytra and abdomen variegated with ash-coloured pubescence. 6–8 : 2¼–2½.—*Staphylinus maxillosus, Linn.*

Head black, shining, finely punctulated, with a few large punctures behind the eyes; the latter oblong and depressed; palpi and antennæ black, the apex of the latter fuscescent: thorax anteriorly scarcely narrower than the head, rounded behind, forming a semicircle, the disk black and highly polished, the sides narrowly margined and punctured, particularly on the anterior angles: scutellum triangular, with a tuft of black hairs: elytra considerably longer than the thorax, triangularly sinuated behind, punctulated, with a row of four or five large impressed points on each, and a broad, irregular, common fascia, composed of ashy hairs; the hinder margin ciliated with black hairs: abdomen black, slightly variegated with cinereous pubescence: under side of the body black, somewhat shining, pubescent, the three antepenultimate segments cinereous: legs black, the tarsi with shining brown ciliæ, the anterior pair dilated in both sexes, and spongy beneath.

Plentiful on carcasses, especially on the sea-shore. When disturbed, it coils itself up, and remains quite inactive, unlike the other *Staphylinidæ*, which are remarkable for the threatening attitude they assume when alarmed. Although the organic structure of insects is usually symmetrical, there are a few exceptions to the rule. In *Hister lævis*, for example, the left mandible is longer than the right; and in the species just described, the tooth in the middle of the left mandible is bifid, while that of the right one is entire.

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* *See Annales des Sciences* Nat. Oct. 1825, and Regne Animal.

C. ciliáris.—Black, with ash-coloured pubescence, the scutellum, apex of the elytra, and terminal segment of the abdomen, covered with golden yellow hairs. 7½.—*Leach. Steph.*

"Black: head scarcely broader than the thorax, glabrous, punctulated, with larger impressions behind the eyes, the sides slightly ashy pubescent: thorax nearly semi-oval, very smooth, shining, glabrous: scutellum clothed with a golden-fulvous pubescence: elytra very much punctulated, each with four larger spots disposed longitudinally on the disk, and one outwardly between the two intermediate ones, the surface with an ashy pubescence, and the apex with long golden-fulvous cilia: abdomen with an ashy pile, the margins of the segments ciliated with golden-fulvous, and the apical joint the same: beneath the three basal joints edged with silvery pile, and the remainder with golden: legs clothed with fulvous pile."—*Steph. Illus.* v. 202.

This rare insect we have never seen. A single specimen, procured by Dr Leach near Edinburgh, is said by Mr Stephens to be preserved in the British Museum.

GENUS—STAPHYLÍNUS, *Linn.*—Antennæ filiform, pilose, 11-jointed, the radical joint as long as the 2d and 3d united, 2d rather short, obconic, the remainder subglobose, or turbinate, the terminal one drawn out to a point on one side: maxillary palpi with the terminal joint shorter and more slender than the two preceding ones, fusiform truncate: head large, as wide or wider than the thorax, to which it is united by a distinct neck: thorax rounded behind: elytra quadrate: legs of moderate length; tarsi 5-jointed, the anterior pair dilated.

S. murínus.—Black, clothed with cinereous pubescence clouded with black, antennæ testaceous at the base, legs black. 5–5½.—*Linn. Fab. Grav. Gyllen.*

Head large, black with a slight coppery or brassy lustre, punctured, and slightly pubescent; antennæ ferruginous at the base, the upper portion brownish: thorax very slightly emarginate in front, with acute angles, elongate, rounded behind, and narrowly margined, the surface covered with short ash-coloured hairs obscurely variegated with brownish: elytra dusky brass-coloured, the pubescence similar to that of the thorax: abdomen black, the two anterior segments slightly silky, with yellow and black pubescence, the under side with silvery hairs: legs black.

This insect has occurred very sparingly within our district. It is abundant in the south of England.

S. pubéscens.—Clothed above with greyish-yellow down, and beneath with dense silvery hairs, the thighs with a testaceous ring near the apex. 5½–6.—*Fab. Grav. Marsh. Gyllen.*

Head thickly covered with yellowish down, having a very smooth glossy spot, of a rhomboidal form, in the middle, and several small round ones scattered over the surface; mouth pale; antennæ blackish, several of the radical joints partly ferruginous: thorax scarcely margined on the sides, the surface thickly punctured and not very equal, variegated with tufts of velvet-black and dusky-ferruginous hairs: scutellum with two velvet-black spots: elytra clothed like the thorax: abdomen brownish-black on the upper side, with a row of triangular spots down the middle slightly ash-coloured, and others velvet-black; the under side thickly covered with depressed ash-coloured hairs, which have a fine silvery lustre in certain lights: legs black, the thighs having a testaceous ring near the apex.

On old walls, pathways, &c. during the spring months, occasional. Near Merchiston Castle. Loanhead. Canal banks near Slateford, &c.

S. erythrópterus.—Dull black, the base of the antennæ, elytra, and legs red, the hinder margin of the thorax covered with golden-yellow hairs, scutellum black, the head orbicular. 5½–8.—*Linn. Fab. Oliv. Marsh Gyllen.*

Head orbicular, dull black, thickly punctured, with shining golden-yellow hairs in front; antennæ brownish-black, several of the radical joints reddish; neck black, with golden-yellow hairs: thorax thickly covered with minute punctures, having a smooth linear space down the middle, with dark pubescence, and golden-yellow hairs on the hinder margin, and on each of the anterior angles: elytra dull testaceous-red, pubescent and punctured: abdomen black above, pubescent, each segment with two oblique patches of light golden-yellow hairs, one on each side: under side black, with a golden-yellow spot on each side of the breast, and one on each side of the abdominal segments: legs red.

Of occasional occurrence in the Edinburgh district. Nowhere so frequent in Scotland as in the more southern parts of the island.

S. castanópterus.—Dull black, the base and apex of the antennæ, together with the elytra and legs, red, scutellum golden-yellow, head orbicular. 5–6: 1½.—*Grav. Gyllen.*

Head as in the preceding species; antennæ brownish, the three radical joints, and generally the two terminal ones, reddish; neck with bright golden-yellow hairs: thorax entirely black, pubescent: scutellum covered with golden-yellow hairs: elytra red, punctured, and pubescent; abdomen and legs nearly as in *S. erythropterus.*

Found not unfrequently under stones, by the sides of highways, in cattle pastures, &c. King's Park. Fields about Duddingston, &c.

S. stercorárius.—Dull black, the base of the antennæ, elytra, and legs red, scutellum black, the head ovate-quadrate. 5–6: 1½.—*Oliv. Grav. Gyllen.*

Very similar to the preceding in size and colour, but readily distinguished by the form of the head, and by having the surface more deeply punctured: head and thorax black, with a faint brassy lustre, the former ovate-quadrate, covered with large punctures, and having a yellow mark across the front, between the antennæ: neck black, punctured: thorax generally narrower than the head, sometimes equal to it in breadth*, having a smooth glossy line in the centre, which is widest behind: elytra red, punctured: abdomen black, pubescent, with a greyish-yellow spot on each side of the segments: legs red, the coxæ black.

Not very common. Near Ravelston, Gilmerton, &c.

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* Such individuals as have the thorax equal in width with the head, are regarded by Mr Kirby as constituting a distinct species, which he has named *S. æriceps*. It is much more likely, however, to form a sexual than a specific distinction, as is the case among some carabideous tribes, in which the thorax is much wider in the females than in the other sex.

S. æneocéphalus.—Brassy-brown, head and thorax glossy, tibiæ and tarsi obscurely testaceous, the abdomen indistinctly marked with longitudinal ash-coloured lines. 5½–6½ : 1¼.—*Gyllen.* *S. sericeus, Marsh.*

Black or brownish-black, with a strong brassy lustre: head shining, punctured; antennæ yellowish-red at the base: thorax glossy, punctured and slightly pubescent, with a polished linear space down the centre: elytra nearly the colour of the thorax, or of a dull testaceous hue, thickly covered with fuscous pubescence: abdomen likewise clothed with fuscous down, and having a few longitudinal lines of ash-coloured hairs, but very indistinctly marked: under side and legs brownish-black, the tibiæ and tarsi obscurely testaceous.

Not unfrequent under stones all round Edinburgh. Apparently equally frequent throughout the south of Scotland.

S. brúnnipes.—Rather dull black, head and thorax glossy, the legs, together with the base and apex of the antennæ, red. 5½–6½ : 1¼–1½.—*Oliv.* *Marsh.*

Head rounded, shining black, punctured, with a smooth central line behind; antennæ black, the radical joint and the two terminal ones red: palpi red: thorax shining black, punctured like the head, and having a smooth linear space down the middle: elytra and abdomen dull black, pubescent, the former shorter than the thorax, but of the same breadth, the latter about half the length of the body: under side slightly glossy, with brownish pubescence; legs red, the anterior coxæ dusky.

Rather common under stones during spring and summer. Salisbury Craigs. Braid Hill. Corstorphine, &c.

GENUS—GOÉRIUS, *Leach.*—Antennæ rather longer than the head, subsetaceous, pilose, 1st joint longest, slightly curved, 2d clavate 3d longer than the 2d, elongate-conic, the rest conic, pedicted, decreasing in diameter to the apex, terminal joint with a semicircular notch, and produced on the one side: maxillary palpi with the 1st joint slender, short, 2d long, curved, clavate, 3d nearly as long as the 2d, clavate, pilose, 4th shorter than the 3d, cylindric, truncate; labial, with the terminal joint longer than the preceding ones, and rather more robust, obliquely truncated: mandibles with a large tooth near the centre, another before it, and a few smaller ones behind: head quadrate, wider than the thorax which is ovate, truncated in front: elytra with the apex truncated obliquely: legs short, rather stout, tarsi 5-jointed, the anterior pair dilated in both sexes.

G. ólens.—Dull-black above, with short matted pubescence, under side somewhat shining black. 10–12 : 2½–3.—*Fab.* *Oliv.* *Grav.* *Marsh.*

Entirely of a dull black colour, excepting the apical joint of the antennæ, which is rufescent: head, thorax, and elytra, covered with a short matted black pubescence, beneath which the surface is finely punctate: elytra as wide as the head, without large punctures, each elytron with the apex truncated obliquely, forming, when united, a triangular sinuosity: abdomen and head beneath shining: legs black, the tarsi obscurely piceous, the anterior pair dilated in both sexes.

This insect presents rather a formidable aspect when it stands as it were at bay with upraised and expanded jaws, and the point of its abdomen turned over its back. Its attitudes when attacked are bold and menacing, and the fierceness of its postures and appearance are probably of use in repelling the attacks of comparatively powerful foes. It is common under stones in all parts of the south of Scotland.

GENUS—**ÓCYPUS**, *Kirby*. From ωκυς, *swift*, and πους, *the foot*.—Antennæ filiform, somewhat slender, 11-jointed, radical joint slightly bent, as long as the 2d and 3d united, 2d short, obconic, 3d longer than the 2d, and of a similar form, the remainder slightly decreasing in length, somewhat turbinate, and placed on short footstalks, terminal notched and produced on the one side: labial palpi with the terminal joint rather dilated, approaching to hatchet-shaped: mandibles long, slender, without teeth, lying across each other: head rounded, wider than the thorax: anterior tarsi dilated in both sexes.—*Steph. Illus.* v. 211.

O. símilis.—Rather dull-black, head and thorax thickly punctured, with a narrow smooth line in the middle of each, tarsi dull ferruginous. 5½-7 : 1½.—*Oliv. Fab. Grav.*

Resembles *G. olens*, but is much smaller and narrower; entirely black, slightly shining on the head and thorax; the former large, and thickly covered with pretty large punctures, except a smooth narrow line in the middle, which appears slightly elevated behind; antennæ inclining to red at the apex: thorax narrowly margined on the sides, the surface punctured like the head, and having a similar smooth line down the middle: elytra rather shorter than the thorax, dull black and pubescent, the surface finely punctured; abdomen long, rather dull, and very minutely punctured; under side more glossy than the upper side: legs black, the tarsi dull reddish.

Under stones and rubbish, frequent. Salisbury Craigs, &c.

GENUS — **QUÉDIUS**, *Leach*.—Antennæ slender, filiform, 11-jointed, the radical joint rather long, 2d short, obconic, 3d longer than the 2d, subclavate, 4th about the length of the 2d, following turbinate, decreasing slightly in length, the terminal one long and rather abruptly pointed: palpi long and slender, the terminal joint longest, slender, fusiform, slightly truncate at the apex: mandibles short, with a few small teeth: head usually rather small and ovate in form: abdomen narrowing gradually to the tip: legs slender, tarsi 5-jointed, the anterior pair a good deal dilated.—*Steph. Illus.* v. 214.

Q. trístis.—Black, shining, antennæ and legs pitchy-ferruginous, head with a transverse series of punctures interrupted in the middle. 4-5½. —*S. tristis*, *Grav.* *S. dilatatus*, *Marsh.*

Head rather narrower than the thorax, with three or four large punctures towards the basal angles, and a short transverse series on each side between the eyes, rather before their middle: the eyes large and oblong; palpi and antennæ ferruginous, sometimes dusky: thorax large, somewhat dilated, convex and very smooth, having three punctures in front, placed obliquely, and four others on each side, the two hinder ones remote: elytra not wider than the thorax, fuscous black, shagreened and pubescent: abdomen thrice the length of the elytra, pilose, black, with metallic reflections, the anal segment emarginate beneath in the male, entire in the female: legs black, tibiæ and tarsi brown; the anterior tarsi dilated.

A common insect throughout all the south of Scotland; usually found under stones.

Q. molochínus.—Black, shining, antennæ and legs pitchy-ferruginous, elytra chesnut-red, the forehead impunctate. 4-4½.—*Grav. Gyllen. S. picipennis*, *Payk.* *Steph.*

Head as in the preceding, but without the transverse punctures, having only a single puncture on the inside of each eye, and two or three behind;

palpi and antennæ ferruginous; thorax with the two dorsal series of punctures as in *Q. tristis*, the sides generally with two punctures only: elytra chesnut-red, thinly pubescent: abdomen tinted with steel-blue and brassy; under side of the body black, shining: legs dusky-ferruginous, the thighs frequently pitch-black.

Not so common as the preceding species, but occurring not unfrequently in numerous places in the environs.

Q. laterális.—Black, shining, with the lateral margins of the elytra pale testaceous, forehead and scutellum impunctate. 4¾–5½ : 1¼.—*Grav. Gyllen.*

Head rounded, black and glossy, with two punctures on the inside of each eye, two others towards the neck, and one or two in the hinder angles; eyes rather large, oblong; palpi pitchy-red, the mandibles long and somewhat projecting; antennæ fuscous black, the 1st joint and the base of the 2d and 3d rufescent: thorax broad, the centre being wider than the elytra, semicircular, black and very glossy, margined on the sides and apex, the disk convex, with two oblique series of punctures anteriorly: scutellum glossy, impunctate: elytra punctulated and pubescent, black, the lateral margins pale testaceous: abdomen black, pubescent, tinted with brassy and violet hues; under side of the body black, pubescent; legs piceous, the tarsi paler.

Of this rare species only a few examples have occurred in Britain. Two have been found in this neighbourhood, one on Corstorphine Hill to the west of the Queensferry Road, and another near Dalkeith.

Q. attenuátus.—Pitch-black, glossy, antennæ and legs testaceous, elytra dull black, thickly punctulated. 3–3½.—*Staph. attenuatus, Grav. Gyllen. Raphirus attenuatus, Steph. Catal.*

Head nearly orbicular, scarcely narrower than the thorax, black and very glossy, with two large punctures on the basal angles, and another on the inner side of each eye; eyes very large; palpi and antennæ pale testaceous: thorax convex, pitch-black, very glossy, impressed with a large puncture on each side within the anterior angle, two smaller ones on the lateral margin behind, and two series of three each on the disk: elytra quadrate, dull black or pitchy, minutely punctulated and sparingly pubescent: abdomen of greater length than in the other species, narrowing gradually to the apex, dull black and pubescent: margins of the abdominal segments beneath, and the whole of the minute terminal one, slightly reddish: legs reddish, often more or less dusky.

Beneath stones in moist places, occasional. Under sea-weed on the shore near Portobello.

Q. impréssus.—Shining black, the elytra margined with rufous, and having four rows of impressed dots on each. 3½–4 : 1.—*Grav. S. marginellus. Marsh.*

Head glossy black, rounded, the vertical angles with a few punctures, and one on the interior margin of each eye; antennæ and palpi fuscous; thorax with two dorsal series of punctures, three in each, and others towards the sides and anterior angles: elytra nearly glabrous, fuscous black, the margins and suture yellowish-red, each with four rows of punctures, the external one somewhat obsolete and placed towards the margin where the elytra begin to be deflected: abdomen pilose, black, with bright brassy and steel-blue tints, the apex of the segments on the under side reddish: thighs piceous, tibiæ and tarsi brown; the anterior tarsi dilated.

Frequent on wall-tops, near stables, &c. appearing, when the weather is warm, as early as the middle of March. Road-sides all round Edinburgh.

GENUS—**ÓCYPUS**, *Kirby*. From ωκυς, *swift*, and πους, *the foot*.—Antennæ filiform, somewhat slender, 11-jointed, radical joint slightly bent, as long as the 2d and 3d united, 2d short, obconic, 3d longer than the 2d, and of a similar form, the remainder slightly decreasing in length, somewhat turbinate, and placed on short footstalks, terminal notched and produced on the one side: labial palpi with the terminal joint rather dilated, approaching to hatchet-shaped: mandibles long, slender, without teeth, lying across each other: head rounded, wider than the thorax: anterior tarsi dilated in both sexes.—*Steph. Illus.* v. 211.

O. símilis.—Rather dull-black, head and thorax thickly punctured, with a narrow smooth line in the middle of each, tarsi dull ferruginous. 5½-7 : 1½.—*Oliv. Fab. Grav.*

Resembles *G. olens*, but is much smaller and narrower; entirely black, slightly shining on the head and thorax; the former large, and thickly covered with pretty large punctures, except a smooth narrow line in the middle, which appears slightly elevated behind; antennæ inclining to red at the apex: thorax narrowly margined on the sides, the surface punctured like the head, and having a similar smooth line down the middle: elytra rather shorter than the thorax, dull black and pubescent, the surface finely punctured; abdomen long, rather dull, and very minutely punctured; under side more glossy than the upper side: legs black, the tarsi dull reddish.

Under stones and rubbish, frequent. Salisbury Craigs, &c.

GENUS—**QÚEDIUS**, *Leach*.—Antennæ slender, filiform, 11-jointed, the radical joint rather long, 2d short, obconic, 3d longer than the 2d, subclavate, 4th about the length of the 2d, following turbinate, decreasing slightly in length, the terminal one long and rather abruptly pointed: palpi long and slender, the terminal joint longest, slender, fusiform, slightly truncate at the apex: mandibles short, with a few small teeth: head usually rather small and ovate in form: abdomen narrowing gradually to the tip: legs slender, tarsi 5-jointed, the anterior pair a good deal dilated.—*Steph. Illus.* v. 214.

Q. trístis.—Black, shining, antennæ and legs pitchy-ferruginous, head with a transverse series of punctures interrupted in the middle. 4-5½.—*S. tristis, Grav. S. dilatatus, Marsh.*

Head rather narrower than the thorax, with three or four large punctures towards the basal angles, and a short transverse series on each side between the eyes, rather before their middle: the eyes large and oblong; palpi and antennæ ferruginous, sometimes dusky: thorax large, somewhat dilated, convex and very smooth, having three punctures in front, placed obliquely, and four others on each side, the two hinder ones remote: elytra not wider than the thorax, fuscous black, shagreened and pubescent: abdomen thrice the length of the elytra, pilose, black, with metallic reflections, the anal segment emarginate beneath in the male, entire in the female: legs black, tibiæ and tarsi brown; the anterior tarsi dilated.

A common insect throughout all the south of Scotland; usually found under stones.

Q. molochínus.—Black, shining, antennæ and legs pitchy-ferruginous, elytra chesnut-red, the forehead impunctate. 4-4½.—*Grav. Gyllen. S. picipennis, Payk. Steph.*

Head as in the preceding, but without the transverse punctures, having only a single puncture on the inside of each eye, and two or three behind;

palpi and antennæ ferruginous ; thorax with the two dorsal series of punctures as in *Q. tristis*, the sides generally with two punctures only : elytra chesnut-red, thinly pubescent : abdomen tinted with steel-blue and brassy ; under side of the body black, shining : legs dusky-ferruginous, the thighs frequently pitch-black.

Not so common as the preceding species, but occurring not unfrequently in numerous places in the environs.

Q. laterális.—Black, shining; with the lateral margins of the elytra pale testaceous, forehead and scutellum impunctate. 4¾–5½ : 1¼.—*Grav. Gyllen.*

Head rounded, black and glossy, with two punctures on the inside of each eye, two others towards the neck, and one or two in the hinder angles; eyes rather large, oblong; palpi pitchy-red, the mandibles long and somewhat projecting; antennæ fuscous black, the 1st joint and the base of the 2d and 3d rufescent: thorax broad, the centre being wider than the elytra, semicircular, black and very glossy, margined on the sides and apex, the disk convex, with two oblique series of punctures anteriorly: scutellum glossy, impunctate: elytra punctulated and pubescent, black, the lateral margins pale testaceous: abdomen black, pubescent, tinted with brassy and violet hues; under side of the body black, pubescent; legs piceous, the tarsi paler.

Of this rare species only a few examples have occurred in Britain. Two have been found in this neighbourhood, one on Corstorphine Hill to the west of the Queensferry Road, and another near Dalkeith.

Q. attenuátus.—Pitch-black, glossy, antennæ and legs testaceous, elytra dull black, thickly punctulated. 3–3½.—*Staph. attenuatus, Grav. Gyllen. Raphirus attenuatus, Steph. Catal.*

Head nearly orbicular, scarcely narrower than the thorax, black and very glossy, with two large punctures on the basal angles, and another on the inner side of each eye; eyes very large; palpi and antennæ pale testaceous: thorax convex, pitch-black, very glossy, impressed with a large puncture on each side within the anterior angle, two smaller ones on the lateral margin behind, and two series of three each on the disk: elytra quadrate, dull black or pitchy, minutely punctulated and sparingly pubescent: abdomen of greater length than in the other species, narrowing gradually to the apex, dull black and pubescent: margins of the abdominal segments beneath, and the whole of the minute terminal one, slightly reddish: legs reddish, often more or less dusky.

Beneath stones in moist places, occasional. Under sea-weed on the shore near Portobello.

Q. impréssus.—Shining black, the elytra margined with rufous, and having four rows of impressed dots on each. 3½–4 : 1.—*Grav. S. marginellus. Marsh.*

Head glossy black, rounded, the vertical angles with a few punctures, and one on the interior margin of each eye; antennæ and palpi fuscous; thorax with two dorsal series of punctures, three in each, and others towards the sides and anterior angles: elytra nearly glabrous, fuscous black, the margins and suture yellowish-red, each with four rows of punctures, the external one somewhat obsolete and placed towards the margin where the elytra begin to be deflected: abdomen pilose, black, with bright brassy and steel-blue tints, the apex of the segments on the under side reddish: thighs piceous, tibiæ and tarsi brown; the anterior tarsi dilated.

Frequent on wall-tops, near stables, &c. appearing, when the weather is warm, as early as the middle of March. Road-sides all round Edinburgh.

Q. suturális.—Pitch-black, the antennæ, legs, lateral margins of the elytra and the suture red. 2¾.—*Marsh. Steph.*

Head pitch-black, shining, rather narrower than the thorax, having a few large punctures on the hinder angles, and two on the inside of the eyes: antennæ reddish, sometimes a little dusky towards the tip: thorax pitch-black, glossy, impressed with two rows of punctures along the back, each consisting of five punctures, and a few others on the sides and front: elytra pitch-black, the outer margins and the suture red, the surface thickly punctured and pubescent: abdomen likewise pitch-black, somewhat shining, the segments narrowly edged with reddish: legs rufo-testaceous.

Found in such places as the preceding, but not so common.

GENUS—**PHILÓNTHUS**, *Leach.* From φιλος, *a lover*, and ονθος, *dung.* Antennæ filiform, 11-jointed, the radical joint long and robust, 2d and 3d rather long, slender, and slightly club-shaped, remainder short, transverse, or nodose, the terminal one largest and obliquely notched at the tip: palpi with the terminal joint slender, truncate, longer than the others: mandibles more or less toothed, the blades unequal: head quadrate-orbicular, or slightly ovate: legs not very long; tibiæ covered with down on the inside; tarsi 5-jointed, rather slightly dilated.—*Steph. Illus.* v. 226.

A. *Thorax impunctate on the disk.*

P. spléndens.—Black, resplendent, with the elytra greenish-brass, the sides of the thorax slightly sinuated. 5–5½.—*Steph.* . *S. splendens.*

Head transverse, quadrate, broader than the thorax in the male, narrower in the female, convex, very smooth and shining, with a few large punctures behind the eyes, and two on the forehead; palpi and antennæ black: thorax slightly tinged with brassy, highly resplendent, the sides sinuated and margined, the anterior angles with a few punctures: elytra scarcely wider than the thorax, each truncate obliquely at the apex, rather depressed above, greenish brassy, shining, punctulated and pubescent: abdomen not twice the length of the elytra, black with steel-blue tints, pubescent; under side of the body similar, the terminal segment nearly bifid in the male, the next emarginate; legs black, the anterior tarsi scarcely dilated.

Under stones in the King's Park and elsewhere, rather common.

P. laminátus.—Black, head and thorax faint brassy green, very glossy, elytra bluish-green, the sides of the thorax rounded. 4–5.—*Steph. Grav. Gyllen.*

Head and thorax black, with a brassy-green lustre, resplendent; the former rounded ovate, narrower than the thorax, punctured behind the eyes, and having two remote punctures in front; the latter obtusely rounded behind, margined, with a few punctures towards the sides and anterior angles: elytra as in the preceding species, the colour generally bluish-green: abdomen more than twice the length of the elytra, more conical than in *P. splendens*, black, or violaceous-black, pubescent; under side of the body and legs black, pubescent, the penultimate segment in the males much produced and rounded at the apex; palpi and antennæ black.

Not scarce under stones and among grass. Salisbury Craigs, &c.

B. *Thorax with two longitudinal series of four punctures each near the middle.*

P. polítus.—Glossy black, somewhat greenish above, elytra brassy, head ovate, and narrower than the thorax. 3½–5.—*Steph. Linn. Grav. Marsh.*

Very similar to the last, but generally of a smaller size, and distinguished by the punctation of the thorax, &c.: head ovate, rather narrow with punctures behind the eyes, and two on each side in front, placed transversely; palpi pitchy black; antennæ blackish, the radical joint generally pale testaceous beneath: thorax with two parallel rows of remote punctures, four in each row, placed towards the middle, three other punctures on each side, and two within each of the interior angles: elytra a little wider than the thorax, rather dull brassy, or somewhat greenish, the surface appearing finely granulated and pubescent: abdomen black, not unfrequently with brassy or bluish reflections: under side and legs black.

In manured fields, and the vicinity of stables, of frequent occurrence in all parts of the country.

P. marginátus.—Shining black, the sides of the thorax and legs testaceous-yellow. 3–4.—*Fab. Grav. Marsh.*

Proportionably narrower than any of the preceding, and destitute of metallic lustre: head and thorax black, shining, punctured nearly as in *P. politus*, the thorax with the lateral margins yellowish: scutellum and elytra fuscous black, sometimes very faintly tinged with green, finely punctulated and pubescent: abdomen bluish-black, pubescent: under side of the thorax yellow-testaceous, the breast and abdomen black, with the margins of the segments rufescent; legs yellow-testaceous, the tarsi dusky: antennæ black, the radical joint yellowish beneath.

Under stones, among moss, &c.: occasional. Base of Arthur's Seat. Pentland Hills. Apparently most frequent in elevated woods and mountainous places.

C. *Thorax with two dorsal series of five punctures each.*

P. várians.—Glossy black, elytra fuscous, tinged with green, legs pitchy-brown, head nearly orbicular. 2¾–3.—*Steph. Gyllen. Grav.? Oliv.?*

Head scarcely narrower than the thorax, and of a rounded form, smooth and glossy, with few or no punctures on the front and hinder angles; palpi and antennæ black: thorax smooth glossy black, with two rows of punctures on the disk, each row consisting of five punctures: elytra fuscous, somewhat greenish, rough on the surface and pubescent: abdomen black, slightly shining: legs brownish, the anterior coxæ sometimes with a yellowish spot.

Plentiful in some seasons in fields, and by the sides of highways, all around Edinburgh.

P. bipustulátus.—Black, shining, elytra with a longitudinal patch of red which is widest behind, legs black. 3½.—*Steph. Grav.*

Head rather narrower than the thorax, black and shining, with a few large punctures in the hinder angles and on the forehead: palpi and antennæ black, the mouth rather pitchy: thorax the colour of the head, the punctures disposed as in the preceding species: elytra not so glossy as the head and thorax, black, with a long patch of red on the disk, which is placed somewhat obliquely, and is widest behind: abdomen rather obtuse at the apex, black, obsoletely punctured, and pubescent: under side and legs likewise black.

Var. b. Elytra brownish-black, with a linear streak of red on the disk, the anterior legs yellowish at the base.—*P. lituratus, Kirby. Steph.*

In fields and woods under stones, occasional. Base of Salisbury Craigs, &c.

P. corrúscus.—Shining black, elytra red, head subovate, legs and antennæ black. 3½.—*Steph.* *S. corruscus, Grav.*

Entirely shining black, the elytra alone being red: head rather small, narrower than the thorax, the antennæ black, twice the length of the head: thorax glossy black, with impressed punctures disposed as in the foregoing species: elytra red, with a few short scattered hairs: under side and legs black.

Everywhere scarce. We procured a few species some years ago from the vicinity of Dalkeith.

Genus—**ÓTHIUS**, *Leach.*—Antennæ filiform, rather robust, pilose, the radical joint as long as the 2d and 3d united, or rather longer, and clavate, 2d and 3d obconic, the seven following short, somewhat cup-shaped, terminal ovate, rather acuminated: maxillary palpi filiform, the terminal joint conical and acuminated: head as wide as the thorax, oblong ovate: thorax rather long, truncated in front, rounded behind: anterior legs strong; tarsi 5-jointed, the anterior pair much dilated and ciliated on the edges and beneath.

O. fúlgidus.—Glossy black, elytra, antennæ, legs, and terminal segment of the abdomen, testaceous-red. 3¾-4.—*Staph. fulgidus, Payk.* *S. fulminans, Grav.*

Head oblong-ovate, as wide as the thorax, glossy black, punctured on each side, having a transverse series of three or four remote punctures between the eyes, and a short obsolete impression over the base of the antennæ; mouth and palpi testaceous, the antennæ of a deeper red: thorax glossy black, frequently inclining to reddish, with a few small punctures within the lateral margins, and three larger ones on each side: elytra shining red, not very thickly but rather deeply punctured, and clothed with short pubescence: abdomen shorter than the rest of the body, rather obtuse, black, slightly shining, the terminal segment reddish: under side pitch-red: legs testaceous-red.

Under stones in fields, and among rubbish, not scarce.

O. altérnans.—Testaceous-red, very glossy, the head, elytra, and two penultimate segments of the abdomen black. 3-3½.—*Grav.* *Staph. alternans, Gyllen.*

Head rather wider than the thorax, somewhat quadrate, narrowed towards the mouth, black, smooth and shining, with a few punctures behind; palpi and antennæ ferruginous, the latter covered with long hairs: thorax testaceous or pitch-red, smooth and shining, with a large puncture on each side anteriorly, and a pair on the disk near the middle: elytra smooth and glossy black, without hairs or punctures, having a single stria on each side of the suture: abdomen testaceous-red, the two penultimate segments almost entirely black: legs testaceous.

Under the bark, and in the wood of decaying trees, occasional. Braid wood. Duddingston.

Genus—**GYROHÝPNUS**, *Kirby.*—Antennæ filiform, rather short and robust, the radical joint considerably longer than the 2d and 3d united, making the antennæ appear geniculated, 2d and 3d obconic, the seven following transverse, somewhat cup-shaped, terminal ovate, somewhat acuminated; maxillary palpi with the terminal joint elongate ovate, approaching to conical: head oblong-quadrate: thorax scarcely narrower than the head, elongate, obtusely rounded behind: legs rather short and stout, the anterior tarsi scarcely or not at all dilated.

G. lóngiceps.—Glossy black, antennæ and legs ferruginous, elytra piceous, or inclining to chesnut colour, thorax punctured, having a smooth space down the middle, bounded on each side by a close row of punctures. 2¾–3.—*Grav.* *Gyllen.*

Head large, oblong-quadrate, smooth on the forehead, the sides and vertex pretty thickly covered with small punctures; palpi and antennæ ferruginous-red: thorax usually rather narrower than the head, widest in front, and narrowed behind, where it is obtusely rounded, the sides thickly and irregularly covered with punctures, and a smooth space down the middle, on each side of which the punctures form a pretty regular line; the colour shining black, slightly glossed with brassy: elytra dusky-piceous, more or less inclining to ferruginous, covered with irregular distinct punctures: abdomen black, with brownish pubescence; legs ferruginous.

Frequent beneath stones in manured fields, &c. all around Edinburgh.

G. elongátus.—Shining black, the mouth and tarsi ferruginous, the punctures on the elytra forming irregular striæ on the external margin, thorax with a smooth space in the centre, bounded on each side by a row o punctures from six to eight in number. 2¾–3¼.—*Grav.* *Staph. punctulatus, Gyllen.*

Very similar to the last, of the same length, but rather thicker: head black, thickly covered with rather large oblong punctures, which become smaller in the middle of the forehead, but scarcely leave a smooth space; antennæ pitchy, the mouth and palpi ferruginous: thorax glossy black, with two dorsal lines of 5–8 deep punctures, and another series on each side exterior to these, which is bent in a semicircular manner anteriorly, and smaller punctures within the margin: elytra blackish, rather deeply punctured, the punctures forming pretty regular striæ towards the external margin; abdomen and under side of the body black, the extremity testaceous; legs piceous, the tarsi ferruginous.

In such places as the foregoing species, occasional.

GENUS—LATHRÓBIUM, *Grav.*—Antennæ inserted on the anterior part of the head, near the inner base of the mandibles, filiform, the radical joint long, somewhat obconic, 2d short, 3d larger, clavate, seven following rounded, the terminal one ovate-acute: maxillary palpi projecting beyond the mandibles, one-half longer than the labial pair, the 2d and 3d joints large and conic, the latter elongate and thickened; the terminal joint in all the palpi very short, slender, and pointed: head united to the thorax by a distinct neck: thorax elongate-quadrate, thickly punctured, the hinder margin truncated: legs strong; anterior thighs thickened, tarsi 5-jointed, the anterior pair much dilated.—*Lat. Gen.* i. 289.

L. elongátum.—Black, somewhat shining, the antennæ, mouth, legs, and hinder part of the elytra, testaceous-red. 3¾–4½.—*Grav.* *Gyllen.* *Staph. elongatus, Linn.* *Marsh.*

Head somewhat rounded, rather shining black, very thickly punctured, the punctures smaller, and less thickly placed on the forehead; mouth pitchy-red, the palpi pale red, antennæ ferruginous and pubescent: thorax a little convex, the same colour as the head, but more thickly and deeply punctured, with a smooth glossy line down the middle: elytra rather longer and wider than the thorax, and irregularly punctured, the base black, the apex rather bright red: abdomen black, with the apex ferruginous, the surface very thickly punctulated: legs short and strong, pale testaceous-red.

Scarce in Scotland: in this quarter it has been found near Cramond, and at Lasswade.

L. lineáre.—Linear, black, somewhat shining, mouth, antennæ, and legs ferruginous. 3½.—*Grav. Gyllen.*

Linear and narrow: head subovate, black and slightly shining, pretty thickly punctured and pubescent; mouth ferruginous, the palpi and antennæ of the same colour, the penultimate joint of the maxillary palpi large and clavate: thorax elongate, rather narrower than the head, somewhat shining black, very thickly punctured, except in the middle where there is a smooth linear space: elytra pitchy, more or less inclining to red, pretty thickly covered with punctures, which occasionally form broken irregular lines near the suture: abdomen rather dull black, the apex obscurely reddish: under side pitch-black; legs ferruginous, the anterior thighs thickened and armed with a strong tooth beneath.

Under stones and moss in damp places, occasional. We have taken it at Dalkeith, Duddingston, and Cramond.

FAMILY—STENIDÆ.

GENUS—PÆDERUS, *Fab.*—Antennæ thickening slightly towards the apex, 11-jointed, radical joint rather long and robust, 2d short, 3d as long as the first, the rest rather longer than the second, the four last thickening gradually, the terminal one ovate, truncated obliquely: maxillary palpi long and robust, 3d joint longest, very large, clavate, truncate, with a minute depressed retractile joint at its apex (Pl. II. fig. 15.): mandibles long and narrow, with a bifid projection on the inner side near the middle: head large, somewhat ovate, united by a distinct neck to the thorax, the latter obovate, smooth, or very sparingly punctured: elytra quadrate: abdomen with the penultimate joint longest; legs pilose, without spines; tarsi 5-jointed, the penultimate joint divided, the anterior pair dilated in the males—*Curtis, B. E.* iii. 108.

P. ripárius.—Shining red, the head, apex of the abdomen and breast black, elytra blue, deeply punctured. 2¾–3¼.—*Fab. Grav. Staph. riparius, Linn. Marsh.*

Head nearly orbicular, rather wider than the thorax, of a shining black colour, very smooth in the centre, but thickly punctulated on the sides; mouth and palpi testaceous, the tip of the maxillary palpi dusky; antennæ testaceous at the base, the upper part dusky: thorax very convex, testaceous-red, very glossy, the sides with a few obsolete punctures: elytra longer than the thorax, of a deep blue colour, rather dull, and thickly marked with strong punctures: abdomen testaceous-red, the three terminal segments shining black: breast beneath black: legs testaceous-red, the apex of the thighs and base of the tibiæ blackish, the tarsi dusky.

On banks by the sides of rivers, under stones, and among grass, far from common. April—May.

GENUS—RÚGILUS, *Leach.*—Antennæ slightly clavate, pilose, 11-jointed, the radical joint considerably longest, the 2d and 4th of equal length, the 3d rather longer, the rest increasing in width, the terminal one somewhat conic: maxillary palpus with the 3d or penultimate joint twice the length of the 2d, clavate, pilose, the terminal joint small and acute: mandibles long and slender, the apex narrow and acute, the inner side with three or four sharp teeth (Pl. II. fig. 16.): head orbicular, much wider than the thorax; the latter somewhat elongate-ovate, united to the head by a very slender neck: elytra wider than the head: abdomen margined, the penultimate joint lengthened: legs slender, the anterior pair the most robust; tarsi 5-jointed, the 1st joint longest in the two hinder pair, the unguicular longest in the anterior.—Curtis, B. E. iv. 168.

R. orbiculátus.—Black, with the mouth, antennæ, and legs testaceous, the head and thorax thickly punctured, the latter having a smooth line in the centre. 1¾–2¼.—*Staph. orbiculutus, Marsh.*

Head very large and rounded, black, the surface very thickly and coarsely punctured; mouth reddish, palpi testaceous, the antennæ ferruginous: thorax narrower than the head, the sides rather dilated before the middle, punctured like the head and of the same colour, with a smooth glossy slightly elevated line down the centre: elytra wider than the thorax, shining pitch-black, with the apex occasionally reddish, the surface rather thinly punctured, and slightly pubescent: abdomen black, somewhat glossy, the penultimate segment longest, the apex rather obtuse: under side black: legs testaceous.

Occurs occasionally in sandy places, usually where there is some degree of moisture. Shore at Newhaven. Water of Leith, &c.

R. immunis of Kirby we have taken near Jedburgh, and have seen specimens of R. punctipennis from the vicinity of Moffat.

GENUS—SÚNIUS, *Leach.*—Antennæ filiform, shorter than the thorax, the radical joint rather long, 2d and 3d shorter and clavate, the following somewhat orbicular, terminal ovate, obliquely truncated at the tip: maxillary palpi with the 4th or terminal joint indistinct, forming with the preceding joint an oval-ovate club: body long and very narrow: head oblong-quadrate, nearly twice the breadth of the thorax; the latter small, narrowed behind, and thickly punctured throughout: tarsi 5-jointed, the penultimate joint bifid.

S. angustátus.—Rather dull pitch-black, with the mouth, antennæ, and apex of the elytra testaceous. 1½.—*Pæderus angustatus, Grav. Gyllen. Staph. angustatus, Fab. Marsh.*

Head large, oblong-quadrate, very thickly punctured and of a dull black colour, the mouth and antennæ testaceous: thorax small, widest towards the front, thickly punctured throughout and of the same colour as the head: elytra likewise strongly punctured, pitchy-black, somewhat shining, the apex testaceous, the latter colour ascending a short way along each side of the suture: abdomen black, linear, the apex obtuse and sometimes testaceous: under side black: legs pale testaceous.

Not of very frequent occurrence, but found now and then in dry places under stones and moss. S. melanocephalus has occurred in Dumfries-shire.

GENUS—DIANOUS, *Leach.*—Antennæ nearly half the length of the body, pilose, rather slender, the two radical joints thickened, the 1st considerably longer than the 2d, 3d much the longest, slender, the remainder gradually shortening and obconic, the three terminal joints thickened, the apical one acute: maxillary palpi very long, the terminal joint rather longest and clavate, the apex rounded (Pl. II. fig. 17.): head large, the eyes prominent: thorax narrower than the head, truncated before and behind, the sides a little dilated: abdomen conical: legs rather long and slender, tarsi 5-jointed, the unguicular joint longest, the penultimate one slightly bilobed.—*Curtis, B. E.* iii. 107.

D. cæruléscens.—Bluish-black, punctured, each elytron with a yellowish-red spot of a rounded form rather behind the middle. 2½.—*Stenus cærulescens, Gyllen. Dianous rugulosus, Leach.*

Similar in form to the species of the following genus, but considerably wider in proportion to its length; of a blue-black colour, pretty thickly punctured and glabrous: head with two long foveæ behind, terminating near the base of the antennæ, the latter as well as the palpi black and pubescent; mandibles inclining to testaceous: thorax truncated before and behind, slightly dilated before the middle, pretty thickly and deeply punctured, the surface rather unequal: elytra wider than the head, punctured like the thorax, rather unequal on the surface, of a blue-black colour, with a round spot of yellowish-red on the disk of each rather behind the middle: abdomen short and conical, margined on the sides; under side and legs black, slightly glossed with blue.

This insect was first found in Scotland by Dr Leach, who met with it near Rosslyn Castle. We took an individual on the wing last autumn a little to the east of Edinburgh, and another on Burntsfield Links. It appears, however, to be very scarce.

GENUS—STÉNUS, *Latreille*. From *στενος*, *narrow*, referring to the attenuated form of the insects.—Antennæ inserted close to the anterior margin of the eyes, rather abruptly clavate, the two basal joints somewhat robust, the four following slender cylindric, the 3d longest, the 7th clavate, forming the base of a club, terminal conical, with the base rounded (Pl. II. fig. 18.); maxillary palpi long, the terminal joint longest clavate, pilose, the two preceding slender: head triangular: eyes very large, subglobose: thorax narrower than the head, subcylindric: elytra short, quadrate, not covering half of the abdomen; the latter long and convex: legs slender, without spines; tarsi 5-jointed, the radical and unguicular joints longest, the penultimate one bifid.—*Latr.* i. 294. *Curtis*, iv. 164.

This genus was formed by Latreille from the genus Paederus, with which it was confounded first by Fabricius and afterwards by Olivier. The Steni may be collected in damp situations throughout the year, by the sides of rivers and ditches, beneath stones, rejectamenta, and upon aquatic plants. Mr Bainbridge remarked that individuals which he threw upon the water darted like *velia* or *gerris* eighteen or twenty inches along the surface. * Mr Stephens names sixty-five species as indigenous to Britain. Of these a considerable number inhabit Scotland; but as no description of the greater proportion of them has appeared, we consider it better merely to mention such as seem to correspond to those recently named in England, than to attempt a detailed description, which can only be satisfactory when derived from the examination of a much more extensive series of specimens than we happen to possess.

A. *Elytra with a pale round spot on each.*

S. bimaculátus.—Black, forehead with two grooves between the eyes, legs testaceous, with the base and apex of the thighs and tibiæ blackish. 2-2½.—*Gyllen.* *S. Juno*, *Grav.* *Staph. biguttatus*, *Marsh.*

Head large, deeply and thickly punctured, and marked with two grooves between the eyes, the surface with scattered silvery hairs; mouth and palpi ferruginous; antennæ dusky black, more or less inclining to ferruginous in the middle: thorax black, a little dilated on the sides before the middle, the surface very thickly and deeply punctured, and having an obsolete groove down the centre: elytra wider than the thorax, and somewhat longer, coarsely punctured, black, with a round reddish spot on the disk of each, rather *behind the* middle: abdomen with a raised margin on each side, somewhat shining black, faintly punctured, and bearing a few silvery hairs: under side shining black, pubescent; legs testaceous red, the thighs and tibiæ blackish at the base and apex; tarsi dusky.

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* British Entomology, vol. iv. fol. 164.

In sandy places, by the sides of rivers and ponds, not very common. Sides of the Water of Leith above Coltbridge.

S. biguttátus.—Black, forehead excavated, with an obsolete ridge in the middle, legs black. 2–2¼.—*Gyllen. Grav. Samou. Comp.* pl. iv. f. 13.

Body narrower and more elongate than in the preceding, black, thickly punctured, and having a few scattered silvery hairs: forehead much depressed or excavated, with a small indistinct ridge in the middle of the crown; palpi and antennæ black, the former testaceous at the base, and the latter inclining to reddish in the middle: thorax as in the preceding, the central groove just perceptible behind: elytra rather unequal on the surface, very roughly punctured, and having a yellowish-white round spot on each, placed rather behind the middle: abdomen black, margined, faintly punctured, and having scattered silvery hairs: under side and legs wholly black.

Scarce in Scotland. We have taken specimens by the sides of the Esk near Dalkeith, and at Slateford.

B. *Elytra unspotted.*

S. buphthálmus.—Black, unspotted, very thickly punctured, and thinly covered with silvery hairs, the thorax obsoletely grooved. 1⅔.—*Grav. Gyllen.*

Small and narrow, of a uniform black colour, with a few hairs of a silvery hue; head thickly punctured, depressed between the eyes, mouth pitchy, the palpi testaceous at the base; antennæ black: thorax black, punctured like the head, and having an obsolete groove down the middle: elytra longer than the thorax, thickly punctured, the apex truncated somewhat obliquely: abdomen margined on the sides, glossy black: under side and legs black.

Not common. Found on the sides of Duddingston Loch, and in some other places in the neighbourhood.

S. brunnipes, S. unicolor, S. gracilis, S. gonymelas, S. Juncorum, and S. lineatulus, have been found in the south of Scotland.

GENUS—OXÝTELUS, *Grav.* — Antennæ thickened gradually to the apex, the radical joint longest, clavate, 2d and 3d slender, obconic, the following short, increasing in width to the terminal one, which is ovate-acute: palpi short, the maxillary pair not twice the length of the labial, the penultimate joint of both large, thickened, obconic, the terminal one very slender, cylindric-conical, nearly as long as the penultimate: head large, united to the thorax by a neck: thorax nearly semicircular, being truncated in front, and rounded behind: elytra nearly quadrate, longer than the thorax: abdomen obtuse, margined on the sides: legs strong: tibiæ beset with small spines; tarsi when bent backwards, received between the rows of spines on the tibiæ, the unguicular joint long and clavate, the remainder very short.—*Lat. Gen.* i. 295.

This genus frequents excrementitious matters, and several of the species are seen in great numbers in the vicinity of dunghills. Others occur in damp herbage, where different kinds of mosses prevail, and a few are found on flowers. They cause occasional annoyance by flying into people's eyes, and when the eye is rubbed, an acrid and irritating fluid escapes from the insect, which is the source of considerable pain. It is probable that many undescribed or obscurely known species exist in almost all countries. They escape observation owing to their diminutive size.

O. mórsitans.—Shining black, the mouth, tibiæ, and tarsi testaceous, thorax with a single groove down the middle. 1¼.—*Grav.* *S. morsitans, Marsh.*

Black, shining, with a few scattered hairs: head large, about the width of the thorax, punctulated, having a deeply impressed transverse arcuate line behind, connected by a short longitudinal furrow to a depressed space in front; mandibles projecting; palpi piceous; antennæ black: thorax nearly semicircular, faintly bisinuated in front, margined, the disk convex, distinctly punctured, with a deep furrow in the centre: elytra short, the apical angles, particularly the sutural one, much rounded, depressed above, pitchy-black, or rufo-testaceous, covered with oblong punctures, and having a single stria on each side of the suture: abdomen and under side of the body black; thighs piceous, tibiæ and tarsi ferruginous.

Frequent on wall tops, and on blades of grass in cattle pastures, during warm weather.

O. carinátus.—Black, somewhat shining, the mouth and legs pitchy-red, thorax crenulated on the sides, the disk with three longitudinal grooves, which are widened at one end. 2-2½.—*Grav.* *Gyllen.*

Head rather wider than the thorax, somewhat shining on the crown, covered with rather large oblong punctures, except a small elevated piece over the mouth, of a dull black: mouth pitchy-red, the palpi paler; antennæ black, some of the joints inclining to reddish: thorax very short, widest in front, the sides not margined, and minutely crenulated, the surface covered with rather large oblong punctures, and having three shallow grooves in the middle, the central one narrowing gradually behind, and the other two narrowed in front; there is likewise a depression on each side: elytra one-half longer than the thorax, shining black or piceous, rather deeply punctured, the sides somewhat striated: abdomen and under side of the body black: legs pitch-red, the thighs frequently blackish.

A common species throughout the country.

O. píceus.—Black, somewhat shining, the mouth, base of the antennæ, elytra and legs testaceous, thorax with three equal grooves. 1½-2.—*Grav.* *Gyllen.* *Staph. piceus, Linn.* *Fab.* *Marsh.*

Head variable in width in different individuals, shining black, unequal on the surface, minutely punctured, having a shallow fovea in the middle of the front, and two short oblique grooves on the crown; mouth more or less reddish; antennæ black, the four basal joints testaceous: thorax entire on the sides, and narrowly margined, the surface depressed and unequal, shining black, and rather thickly punctured, having three furrows down the middle, which are of equal width throughout their whole length, the central one straight, the others slightly bent; there is likewise a depression on each side: elytra nearly flat above, usually testaceous-red, somewhat shining, thickly and minutely punctured, and marked with a single stria on each side of the suture: abdomen and under side of the body smooth shining black; the legs pale testaceous.

Not unfrequent in cattle pastures, near stables, and on wall tops during warm weather in spring.

O. nitídulus.—Black, somewhat shining, the mouth and legs testaceous, elytra pitchy-red, thorax with three longitudinal grooves. ½-¾.—*Grav. Gyllen.*

Head as wide as the thorax, shining black, minutely and thickly punctured, the mouth and palpi testaceous; antennæ black: thorax short and transverse, the sides rounded and entire, very narrowly margined, the surface depressed and unequal, black, thickly punctured, the sides rather rugged, having three furrows down the middle, and a fovea on each side: elytra pitchy red, thickly punctured: abdomen and under side of the body shining black, scarcely punctured: legs testaceous.

In such places as the preceding, occurring occasionally.

O. sulcatus, O. rugosus, O. nitens, O. pallipes, O. angustatus, O. opacus, species hitherto undescribed, are inhabitants of the south of Scotland.

FAMILY—OMALIDÆ.

GENUS — SYNTÓMIUM, *Curtis.*—Antennæ longer than the head, clavate pilose, 2 basal joints rather robust, ovate, 3d rather long and slender, next 5 globose, the 3 last forming a club, of which the 2 first are cup-shaped, terminal ovate (Pl. II. fig. 19.): maxillary palpi with the last joint short, ovate, acuminated: mandibles bent, acute: head somewhat triangular, the eyes placed at the base: thorax broader than the head, transverse, ovate: elytra wider than the thorax, transverse-quadrate: legs short and slender, tibiæ without spines; the unguicular joint of the tarsi as long as the other four taken together.—*Curtis, B. E.* v. 228.

S. nigroáeneum.—Brassy-brown, shining, the head and elytra covered with large punctures, antennæ and legs inclining to chesnut colour. 1. —*Curtis, l. c. Omalium aeneum, Gyllen.* ?

Head brassy, shining, antennæ dusky, somewhat chesnut colour: thorax rather wider than the head, the hinder angles acuminated; the sides very obscurely serrated, the surface sculptured with large punctures, and a line down the middle, which is slightly elevated behind, and has a shallow fovea on each side: elytra considerably wider than the thorax, punctured in a similar manner, the hinder margin sinuated: abdomen as broad as the elytra, the sides with a reflexed margin, the colour bright brassy: legs dusky chesnut colour.

Usually found under moss, and appears to be pretty frequent in the south of Scotland: it is likely, however, often to escape the notice of the entomologist, owing to its small size and obscure haunts. Woods at Craiglockhart, and about Slateford.

GENUS — PHLOEÓBIUM, *De Jean.* From φλοιος, *bark*, and βιος, *life.* —Antennæ scarcely longer than the thorax, the 2 radical joints much thicker than the rest, the 1st largest, obconic, and suddenly thickened at the apex, 2d short subglobose, 3d and 4th slender obconic, 7-10 somewhat moniliform, and gradually increasing in size to the terminal joint, which is large, ovate, and obtuse: maxillary palpi with the penultimate joint rather thick and obconic, the terminal one slender: body rather depressed: head flat, somewhat triangular, the eyes large and prominent: thorax short and transverse: elytra twice the length of the thorax, or rather longer: abdomen flattish, the sides margined, the apex acuminated: legs slender.

P. depréssum.—Dull black, very thickly punctured, the tibiæ and tarsi ferruginous, thorax with two projections at the hinder angles. 1. —*Staph. depressus, Payk. Oliv. Omalium depressum, Gyllen.*

Rather dull black, the body somewhat depressed: head nearly flat, thickly punctured, with a deep arched groove on each side, extending from the hinder margin to the base of the antennæ, the space between rather elevated; eyes large and prominent; antennæ black: thorax considerably wider than the head, widest behind, rounded on the sides, the margin dilated, and having two projecting angles behind; the surface rather convex, thickly punctured, and having a deep line down the middle: elytra punctured like the thorax, and of a dull dusky black colour: abdomen black, somewhat shining, the apex often reddish: legs ferruginous, the tibiæ not unfrequently blackish.

Inhabits the trunks of trees, and is occasionally found in dung. Not of frequent occurrence in this vicinity.

P. macropterum, we have taken in Roxburghshire, and P. retusum (*Megarthrus retusus, Kirby*) occurs in Dumfries-shire.

GENUS— PROTEÍNUS, *Lat.*—Antennæ rather longer than the thorax, strongly clavate, the radical joint large and obconic, 2d likewise thick but short, 3–7 small and nodose, 8–10 gradually increasing in diameter, the terminal one large and ovate, with the apex slightly acuminated: maxillary palpi subulate, the penultimate joint thickened, the terminal one slender: head triangular; thorax very short and transverse, the sides rounded and margined: legs slender.—*Gen. Crust.* i. 298.

P. brachýpterus.—Black, slightly pubescent, the radical joint of the antennæ, the palpi and legs, testaceous. 1.—*Lat. Omalium ovatum, Grav. Omalium brachypterum, Gyllen.*

Head black, nearly smooth, impressed with a small fovea on each side between the eyes; palpi testaceous; antennæ blackish, the radical joint testaceous: thorax with the anterior angles rounded, the hinder ones straight, the surface black, rather shining, and nearly smooth, having a small impression before the scutellum: elytra a little wider than the thorax, and more than twice its length, the sides finely margined, the surface delicately punctured and pubescent, and of a black colour, the hinder edge inclining to ferruginous: abdomen black, the anal segment pitchy; under side black; legs testaceous.

On the flowers of the hawthorn in May. Near Slateford and elsewhere, but not common.

GENUS—ANTHÓBIUM, *Leach* From *ανθος, a flower*, and *βιος, life*.—Antennæ rather longer than the head and thorax, gradually thickening to the apex, the radical joint longest, 2d short, the remainder more or less obconic, gradually shortening and increasing in diameter to the apex, the terminal joint rounded-ovate, not very acute: palpi with the terminal joint slender, somewhat acuminated: body rather thick, short and ovate: thorax transverse, a little narrower than the elytra, the surface somewhat convex; elytra more than twice the length of the thorax, covering the whole of the abdomen except a small portion of the extremity.

A. Sórbi.—Pale testaceous, minutely punctulated, shining, the eyes and abdomen black. §-1.—*Steph. Omalium Sorbi, Gyllen. Omalium ophthalmicum, Grav.*

Pale testaceous, glabrous, somewhat shining, the head with a few small *foveolæ* on each side anteriorly; the eyes black and prominent, the upper half of the antennæ fuscescent: thorax transverse, rounded on the sides, the hinder angles nearly straight, the surface very delicately punctulated and impressed with an obsolete dorsal line, and a shallow mark on each side behind: elytra ample, of a paler hue than the head and thorax, more glossy, and distinctly punctured: abdomen pitchy-black, the apex sometimes testaceous: legs pale testaceous.

On various flowers. We have observed it in great profusion on those of the hawthorn and broom in numerous places in the vicinity.

A. píceum.—Pitchy-red, rather convex, thickly punctured, antennæ and legs testaceous. 1¾-2.—*Omalium piceum, Gyllen.*

Body thick, glabrous, of a pitchy-red colour, more or less deep: head rather small, thickly covered with pretty large punctures, and slightly impressed between the antennæ, the latter, as well as the palpi, paler than the body: thorax short, with all the angles rounded, the lateral margins dilated and equally rounded, the surface somewhat convex, equal, and covered with punctures like those of the head: elytra twice the length of the thorax, widened behind, the external apical angle rounded, the sutural one straight, the surface rather convex, and thickly covered with deep punctures: abdomen short and smooth: under side and legs pitchy-testaceous, the breast deeply punctured.

Not common, single specimens occurring now and then throughout the country. Near Inveresk, and at Cramond.

A. melanocephalum. Roxburghshire, in fungi, not rare.

GENUS — OMÁLIUM, *Grav.*—Antennæ thickening towards the apex, the radical joint long and robust, 2d smaller, 3d rather longer than the 2d, all the 3 clavate, the remainder short and rounded, or turbinate, gradually increasing in diameter to the terminal one, which is acute: maxillary palpi rather long, the terminal joint somewhat acuminated: body oblong, rather flat: thorax considerably narrower than the elytra, the surface rather depressed: elytra about twice the length of the thorax; exposed portion of the abdomen as long as the elytra, not unfrequently twice their length.

A. *Thorax obcordate.*

O. deplanátum.—Rufo-testaceous, shining and somewhat pubescent, the head, abdomen, and disk of the thorax pitchy-black, the latter without impressions. 1¼-1½.—*Gyllen. Omalium depressum, Grav.*

Head shining pitchy-black, thickly punctured, and slightly pubescent, having two or three small inequalities on the surface; the mouth, palpi, and antennæ testaceous-red: thorax slightly obcordate, being somewhat narrowed behind, and rounded on the sides anteriorly, the surface somewhat convex, equal, thickly punctured, of a pitch-black colour, the margins more or less widely testaceous: elytra one-half longer than the thorax, depressed, shining testaceous-red, and thickly covered with rather small punctures: abdomen rather long, the margins much elevated, pitch-black, and pretty thickly pubescent: under side testaceous, the legs of a similar hue.

Not scarce under the bark of decaying trees, in fungi, and occasionally in houses.

B. *Thorax transverse.*

O. florále.—Shining black, the mouth and legs pitchy-red, the thorax obsoletely foveolated. 1¼-1½.—*Omalium Viburni, Grav. Gyllen.*

Head somewhat triangular, depressed, shining black, thinly punctured, having two large foveæ between the antennæ, and two others of smaller size on the crown; mouth and palpi dusky piceous; antennæ black, the terminal joint inclining to testaceous: thorax transverse, dilated in a rounded form on the sides, which are narrowly margined, moderately convex above, shining black, thickly punctured, and having two oblong shallow foveæ before the scutellum: elytra depressed, glossy-black, frequently brownish, roughly punctured, the punctures having a tendency to run into striæ: abdomen and under side of the body shining black, the latter minutely punctured; legs testaceous-red, the thighs obscurely pitchy.

Common on wall tops, in mild weather even in the middle of winter. It emits a strong smell when taken.

O. rivuláre.—Black, somewhat shining, the base of the antennæ and legs rufous, elytra dusky testaceous, the thorax with two long bent impressions. 1⅙–1⅔.—*Grav. Staph. rivularis, Oliv. Marsh.*

Head depressed, shining black, rather deeply, but not thickly punctured, having two impressions between the antennæ, and two others behind the eyes; mandibles reddish, the palpi paler; antennæ black, the radical joint reddish, and some of the following pitchy: thorax somewhat quadrate, the sides dilated and margined, shining black, the hinder angles, and sometimes the sides inclining to ferruginous: the surface rather thickly punctured, and having two long arched foveæ, which are deeply impressed behind: elytra twice the length of the thorax, depressed, dusky-testaceous, thickly and rather deeply punctured: abdomen shining black; under side piceous, shining and punctulated: legs ferruginous, the thighs sometimes dusky at the base.

Frequent on flowers, boleti, &c., throughout the country.

GENUS—ELÓNIUM, *Leach.*—Antennæ longer than the thorax, rather thick, the radical joint longest, obconic, 2d half the length of the 1st, somewhat obconic, 3d rather longer than the 2d, subobconic, 3 following equal subglobose, next 4 larger, nearly cup-shaped, terminal large, ovate: mandibles large, without teeth: body somewhat linear and depressed: thorax long, subquadrate, rather narrowed behind: elytra scarcely longer than the thorax, the humeral and external apical angles rounded, the surface striated: abdomen one-half longer than the elytra, and nearly as broad, the apex obtuse: unguicular joint in the hinder tarsi very long and clavate.

E. striátulum.—Shining-black, mouth and legs pitchy-red, elytra coarsely crenate-striate. 2½.—*Staph. striatulus, Fab. Omalium rugosum, Grav. Gyllen.*

Shining-black: head rather thickly punctulated, with an impressed line across behind the eyes, and a fovea on each side between the antennæ; the latter piceous; the mouth and palpi somewhat ferruginous: thorax with all the angles acute, and rather prominent, the surface punctured like the head, and marked with three deep foveæ in the middle, one of them extending from the front rather beyond the middle, and two others behind of an ovate form, and placed obliquely: elytra depressed, marked with seven or eight broad and coarsely crenated striæ, disappearing before reaching the apex, which is coarsely punctured; the colour usually shining black, but sometimes inclining to pitchy-red: abdomen shining black, punctulated, the margins elevated: under side pitch-black, deeply punctured; legs pitchy-red, inclining to ferruginous.

Has been taken on wall tops, and under sea-weed on the shores of the Firth, but is scarce.

GENUS — LESTÉVA, *Lat.* From *λεστευω*, *I rob*, referring to the predacious habits of the species.—Antennæ much longer than the thorax, nearly filiform, the joints conic-cylindric, the radical and terminal joints longest, the former robust and subovate, the latter conical (Pl. II. fig. 20.): maxillary palpi with the 2d and 3d joints robust and somewhat clavate, the terminal one attenuated towards the apex which is obtuse (Pl. II. fig. 21.): maxillæ bilobed, the internal lobe 2-jointed, the other entire and ciliated: head somewhat trigonate, the neck usually distinct: thorax somewhat obcordate or subquadrate, narrowed behind: elytra oblong-quadrate, much wider than the thorax, and covering about half of the abdomen: tarsi 5-jointed, the claws strong and recurved at the base.—*Lat. Gen.* i. 296. *Curtis, B. E.* vii. 303.

L. Leáchii.—Chesnut-red, smooth and shining, the head and abdomen black, legs testaceous. 3–3¼.—*Curtis, l. c.*

Head black, sparingly punctured, and having a longitudinal groove on the inner side of each eye; mouth and base of the antennæ ferruginous; the apex of the antennæ dusky black: thorax small, about the width of the head, reddish chesnut colour, thinly punctured, and marked with a shallow impression in the front, and three others towards the base: elytra double the width of the thorax, more thickly punctured, but of a similar colour, the hinder margin blackish: abdomen dusky black, minutely punctured, the apex and margins inclining to reddish: legs pale testaceous.

Specimens of this handsome insect have been found in a ditch on Braid Hill, and likewise in Dumfries-shire.

L. carabóides.—Testaceous-red, with the elytra and feet paler, the head and apex of the abdomen dusky. 1¾–2.—*Anthophagus caraboides, Grav. Gyllen. Staph. caraboides, Linn. Oliv.*

Head piceous, strongly punctured, with two oblong impressions in the middle between the eyes; palpi and antennæ pale testaceous: thorax rufo-ferruginous, slightly convex, covered with pretty large and thickly placed punctures, the surface equal and glossy: elytra pale testaceous, with large punctures, the external apical angle rounded, the internal one subacuminated: abdomen depressed, with elevated margins, testaceous, the two penultimate segments more or less suffused with dusky: legs pale.

Frequents the leaves of trees in damp shady woods. It does not appear to be frequent in this neighbourhood, as we have seen only a few specimens from Rosslyn, but it is plentiful during the autumn in Roxburgh and others of the southern counties of Scotland.

L. obscúra.—Fuscous-black, punctulated and pubescent, the antennæ and legs obscurely testaceous. 1¾.—*Anthophagus obscurus, Grav. Gyllen. Carabus staphylinoides, Marsh.*

Head finely punctulated, with a longitudinal impression over each eye; palpi and base of the antennæ obscurely testaceous: thorax thickly punctulated above, with two very obsolete foveolæ, often quite obliterated, in the middle: elytra long, thickly punctured, fuscous-black, sometimes fuscous-testaceous: abdomen and under side of the body black, pubescent: legs testaceous or pale testaceous, the thighs generally dusky.

Under stones in moist places, by the sides of streams, ponds, &c. rather common. This species is liable to considerable variation; the elytra are often pale testaceous, and sometimes the whole body partakes more or less of that colour.

L. testacea is not unfrequent in several of the border counties; L. canaliculata of Kirby, has been found in Scotland by Mr Curtis; and another species, apparently undescribed, was taken last autumn by Mr Wilson among the mountains of Aberdeenshire.

FAMILY—TACHYPORIDÆ.

GENUS—TÁCHINUS, *Grav.* From *ταχινος*, *swift*, the species being distinguished for the rapidity of their motions.—Antennæ the length of the head and thorax, the three lowest joints clavate, the radical one being strongest, the 2d and 3d very slender, 4th frequently small, the remainder gradually becoming thicker, terminal ovate: maxillary palpi filiform, the terminal joint longer than the penultimate and slightly acuminated: body wide, punctulated: head small, and inserted into the thorax up to the eyes: thorax transverse, very large, convex, the hinder angles rounded: elytra convex, longer than the thorax: abdomen conical: tibiæ with strong ciliæ; tarsi slender.—*Grav. Mic.* 134. *Lat. Gen.* 1. 299.

T. subterráneus.—Shining black, elytra with an oblong testaceous spot on each shoulder. 2–2¾.—*Grav. Gyllen. Staph. subterraneus, Linn. Marsh.*,

Upper surface very equal, smooth, glossy black, thickly and minutely punctured: head rounded; mouth and palpi pitch-black; antennæ blackish: thorax narrowly margined on the sides, which are rounded, the surface convex, glossy black, the hinder edge sometimes reddish: elytra glossy black, with a long yellowish patch at the base of each towards the shoulder: abdomen pitch-black, shining, delicately punctured, the edges of the segments inclining to ferruginous: under side pitch-black, shining and punctured: legs pitchy or pitch-red.

On wall-tops near woods in the spring, occasional. Near Ravelston, Cramond Bridge, Gorgie, &c.

T. rúfipes.—Glossy pitch-black, legs and hinder margin of the elytra rufous, antennæ pitchy brown. 2–2⅓.—*Grav. Gyllen. Staph. rufipes, Linn. Marsh.*

Head shining-black, punctulated, mouth testaceous, the mandibles and maxillary palpi pitchy; antennæ pitchy-brown: thorax large, narrowest in front, the angles obtuse, the sides rounded and narrowly margined, rather convex above, glossy black, minutely punctured, the hinder margin edged with ferruginous: elytra rather narrower than the thorax, thickly punctured, shining pitch-black, the apex reddish: exposed portion of the abdomen rather short, pitch-black, shining and punctulated; legs testaceous.

Frequent under stones, &c. on road-sides, in pastures, &c.

T. marginéllus.—Glossy-black, the lateral and posterior margins of the thorax, apex of the elytra and a lateral line on each, rufous. 1¾.—*Grav. Oxyporus marginellus, Fab. Staph. marginatus, Don.* xv. pl. 582. f. 2.

Shining black, minutely punctured; head rounded, convex; mouth pitchy-red; antennæ dusky-black, the radical joint testaceous: thorax very convex, thickly covered with minute punctures, glossy-black, the lateral and hinder margins reddish: elytra narrow, the punctation and colour as in the thorax, the apical margin pale testaceous, and a streak of a similar colour within the margin extending from the shoulder to the apex: abdomen glossy black, the hinder extremity and edges of the segments ferruginous: legs estaceous.

With the preceding species, not unfrequent.

T. colláris.—Shining pitch-black, antennæ, thorax, and legs ferruginous. 1⅓.—*Grav. Gyllen.*

Head glossy black, punctulated, mouth, palpi, and antennæ ferruginous, the apex of the latter rather obscure: thorax with all the angles rounded, entirely glossy ferruginous, thickly covered with small punctures: elytra rather narrower than the thorax, pitch-black, shining, the extremity of the hinder margin pale reddish, the surface rather deeply punctured: abdomen scarcely the length of the elytra and of a similar colour, the apex and margins of the segments pale reddish: legs ferruginous.

Grassy banks by the sea-shore, near Portobello, not common.

T. silphóides.—Smooth glossy black, the lateral margins of the thorax and legs pale testaceous, elytra pale, the outer margin and a large patch on the disk of each black. 1½.—*Gyllen. Staph. Silphoides, Linn. Marsh.*

Head smooth, black and very glossy; mouth pitchy, palpi and antennæ black, the base of the latter testaceous: thorax very convex, the disk smooth, glossy black, the lateral margins pale: elytra very minutely punctulated, pale testaceous, the sides, region of the scutellum, and a large oblong spot on the disk of each, black: abdomen scarcely the length of the elytra, the apex somewhat testaceous, the sides and apex with long black hairs: legs pale testaceous.

The black spot on the elytra is sometimes dilated so as to cover nearly the whole disk, at other times it is very small.

Not common; it has occurred near Cramond, and on the shore west from Newhaven.

T. bipustulatus and T. elongatus, have been taken a little to the south of the Edinburgh district.

GENUS—TACHÝPORUS, *Graven.* Named from ταχυς, *swift*, and πορος, *a passing.*—Antennæ the length of the head and thorax, gradually thickening towards the apex, the radical joint longest and rather robust, 2d very slender, 3d and 4th likewise slender, oblong, the rest somewhat bell-shaped, increasing in size, the terminal one large and ovate: maxillary palpi 4-jointed, the penultimate joint much thickened, the terminal one small and subulate (Pl. II. fig. 22.): body smooth and glossy: head small: thorax large, truncated behind, where it is as wide as the elytra or wider; the latter usually longer than the thorax: abdomen conical, often attenuated at the apex, which is beset with strong hairs: tibiæ spinose; tarsi slender, the first joint longest.—*Grav. Mic.* 124.

T. chrysomélinus.—Glossy black, the thorax, legs, and base of the antennæ yellowish-red, elytra testaceous, with the base and anterior part of the lateral margins black. 1¼.—*Grav. Staph. chrysomelinus, Linn. Marsh. Oxyporus chrysomelinus, Fab.*

Head rather wide, narrowed towards the mouth, and having an impressed line across the crown, the colour black, the surface very smooth, and glossy; mouth, palpi, and antennæ testaceous, the apex of the latter dusky: thorax wide, rather dilated behind, where the angles are produced, the surface very smooth, glossy, and of a pale testaceous colour: scutellum blackish: elytra about the width of the hinder part of the thorax, very minutely punctulated, testaceous, the outer margins anteriorly and the base black: abdomen very short and conical, shining black, the margins of the segments frequently reddish, the sides with a few long black hairs: under side of the breast yellowish, of the abdomen black; legs pale yellow.

Under stones, among moss, at the roots of grass, and occasionally on flowers, pretty frequent. King's Park. Blackford Hill. Figget Whins, among the matted roots of the sea-reed and sand carex.

T. marginátus.—Glossy black, the antennæ, legs, and sides of the thorax testaceous, elytra red, with the outer margin black at the base. 1½. —*Grav.* *Gyllen.*

Very similar to the preceding in size and form; head glossy black; palpi testaceous; antennæ of a similar hue, the apex a little dusky: thorax glossy black, the lateral margins reddish, translucent, especially behind: elytra reddish, the outer margin with a black streak at the base: abdomen rather long and acuminated at the apex, the colour glossy black: under side of the breast and the legs testaceous.

An exceedingly abundant species under stones and among moss, seemingly in all parts of the Lowlands of Scotland.

T. anális.—Glossy testaceous-yellow, the eyes, base of the elytra, breast, and two terminal segments of the abdomen black. 1½–1¾.—*Grav.* *Gyllen.* *Staph. obtusus, Linn.* *Marsh.*

Head testaceous-yellow, more or less inclining to red, very glossy, the eyes black; antennæ dusky, some of the radical joints more or less testaceous: thorax entirely testaceous, very smooth and shining: elytra pale reddish, with a patch of black across the base, which sometimes extends a short way along the outer margin: abdomen deep testaceous-red, the two hinder segments black: under side of the breast black; legs yellowish.

Usually found, like the other species, under stones, but it is not common. Craiglockhart Woods. Sand-banks by the sea-shore, at the roots of the herbage.

T. marginéllus.—Testaceous-red, very glossy, the head and lateral margins of the elytra dusky black. 1⅓ —*Steph.* *Staph. marginellus, Marsh.* ?

Head wide, of a dusky black colour, smooth and shining; palpi and antennæ pale testaceous: thorax wholly testaceous-red; elytra of a similar colour, the sides more or less dusky: abdomen testaceous, with a few rather long black hairs: under side and legs testaceous-red, the latter paler than the body.

Under stones, not unfrequent.

T. ruficóllis.—Glossy black, elytra piceous with the apex pale, the thorax, base of the antennæ and legs testaceous. 1¼.—*Grav.* *Gyllen.*

Head large, very smooth, black, with the mouth and palpi testaceous, the maxillary pair somewhat dusky; antennæ blackish, the base testaceous: thorax testaceous-red: elytra pitchy, the apex pale translucent: abdomen attenuated to the apex, black, with the margins of the segments slightly testaceous: breast black: legs testaceous-red, the thighs often dusky at the base.

Taken occasionally in this neighbourhood, and we have seen specimens from Berwickshire.

T. nitídulus.—Black, very smooth and glossy, the antennæ, legs, and sides of the thorax testaceous, elytra testaceous, margined with black. 1–1¾.—*Grav.* *Gyllen.* *Staph. nitidulus, Oliv.* *Marsh.*

Head pitch-black, smooth and glossy, the mouth, palpi, and antennæ testaceous: thorax glossy black, the lateral margins and sometimes the base, reddish translucent: elytra narrower than the thorax, rather depressed above, and very minutely punctured, testaceous-red, with the lateral margins black at the base: abdomen black, punctulated and pilose, the margins of the segments reddish: body beneath black; legs pale reddish.

Found not unfrequently in this vicinity and in other parts of the country.—T. Hypnorum seems to be a variety of the above.

T. dimidiátus.—Deep shining black, the hinder angles of the thorax, the elytra, margins of the segments of the abdomen and legs testaceous. 1⅔.—*Steph. Oxyporus dimidiatus, Fab.*

Head black and glossy; palpi and base of the antennæ ferruginous, the upper part of the latter black: thorax glossy black, with a considerable portion of the hinder angles reddish: elytra testaceous, the base often slightly suffused with dusky: abdomen black and pilose, the edges of the segments reddish: legs testaceous.

Not common. "Cramond;" *Steph. Illus.*

The other Scotch species of this genus, which contains thirty-nine in all, are T. angustatus, T. collaris, and T. subtestaceus.

GENUS—HYPOCYPHTUS, *Schüppel.*—Antennæ with the two radical and three terminal joints considerably thicker than the intermediate ones which are slender, the terminal one elongate-ovate acute; maxillary palpi with the terminal joint very minute and slightly acuminated: body wide and convex anteriorly: head small, bent inwards: thorax large: elytra convex, wider than the thorax and usually longer: abdomen conical, acute, a very small portion projecting behind the elytra: legs short, slender, and beset with strong hairs.—*Grav. Monograph.*

H. gránulum.—Black, shining, somewhat pubescent, antennæ and legs ferruginous. ⅓–⅔.—*De Jean. Tachyporus granulum, Grav. Cypha rufipes, Kirby. Steph. Scaphidium acuminatum, Marsh.*

Body appearing somewhat globose, being very convex and rounded in front, and the abdomen small and nearly wholly retracted beneath the elytra; of a black colour, rather shining, and subpubescent: head much wider than long; palpi and antennæ dull ferruginous, the terminal joint of the latter elongate: thorax convex, nearly four times wider than long, a little narrowed towards the apex, the margins slightly piceous: elytra convex, rounded on the sides, wider and longer than the thorax: abdomen short and acute, the sides margined: under side black; legs ferruginous.

At the roots of trees under dead leaves and moss, or under stones, occasional.

Two other species of this limited genus, H. nigripes and H. parvulus, are described by Mr Stephens, and examples are said to have been taken in Dumfries-shire.

GENUS—CONÚRUS, *Steph.* From κῶνος, *a cone*, and ουξα, *the tail*, referring to the shape of the abdomen.—Antennæ thickening towards the apex, the three radical joints long and slender, the remainder short, the terminal one largest and somewhat acute: maxillary palpi with the terminal joint small and subulate, the penultimate long and thickened at the apex: head nearly triangular: thorax large, shorter than the elytra: abdomen rather long, much attenuated towards the hinder extremity: legs slender.—*Steph. Illus.* v. 188.

C. obscuripénnis.—Shining ferruginous, with the eyes black, elytra rather obscure. 1.—*Kirby. Steph.*

Smooth and glossy, very convex anteriorly: nearly of a uniform ferruginous or testaceous colour, the eyes alone being black: antennæ yellowish: thorax testaceous, unspotted: elytra usually somewhat dusky, covered with a short silky pubescence: abdomen attenuated towards the apex, and fringed with strong hairs, the colour obscurely ferruginous; legs testaceous.

Among the roots of the sea-reed on the sand-bank facing the sea at Figget Whins. We have not met with it in any other situation.

GENUS—BOLITÓBIUS, *Leach*.—Antennæ slender at the base, and gradually thickening from the 4th joint to the apex; radical joint long, slender, subclavate, 2d, 3d, and 4th likewise slender, rather short, somewhat obconic, the six following short, thickened, and somewhat cup-shaped, the terminal one oblong-ovate: maxillary palpi with the two last joints of equal length, the penultimate obconic, the terminal somewhat attenuated: body attenuated at both ends: head narrow, rather lengthened: thorax with the hinder angles rounded: abdomen rather long and conical: tibiæ with several spines; the four posterior tarsi elongate.

B. atricapíllus.—Glossy red, the head, breast, and apex of the abdomen black, elytra bluish-black, with a transverse wedge-shaped spot on each shoulder and the hinder edge pale. 2¾–3½.—*Steph. Tachinus atricapillus, Grav. Gyllen. Staph. atricapillus, Fab. Oliv. Marsh.*

Head narrow and elongate, glossy black, impunctate, mouth and palpi reddish; four basal joints of the antennæ likewise reddish, six following black, the terminal one pale red: thorax narrowed in front, and bent downwards on each side of the head, glossy red and impunctate, except on the sides, where there are two or three remote punctures: elytra considerably longer than the thorax, of a bright bluish-black colour, with a pale wedge-shaped spot on each, extending somewhat obliquely from the shoulder, where it is widest, towards the suture; the hinder edge is likewise pale, and there are three obsolete rows of punctures on each: abdomen shining red, the penultimate segment black, with the hinder margin pale, the terminal one wholly black: breast black: legs testaceous.

Inhabits decaying Agarici and Boleti in woods, occurring not unfrequently. Woods on the banks of the river Almond. Rosslyn and Dalkeith woods.

B. lunulátus.—Glossy red, the head, breast, and apex of the abdomen black, elytra blackish-blue, with the base and hinder margin reddish. 2–3.—*Steph. Tachinus lunulatus, Grav. Gyllen. Staph. lunulatus, Linn. Marsh.*

Very similar to the preceding species: head black; four basal joints of the antennæ reddish, the rest black, the terminal one somewhat reddish; thorax glossy red, without punctures: elytra reddish across the base, the rest shining blue-black, except the hinder margin, which is pale red, the surface of each marked with three faintly punctured lines: abdomen, under side and legs, as in *B. atricapillus.*

Found with the other species not unfrequently. Woods at Duddingston, &c. in September and November.

GENUS—ISCHNÓSOMA, *Steph.* From ισχνος, *slender*, and σωμα, *body.*—Antennæ rather longer than the thorax, the radical joint large, elongate, obconic, 2d short and nodose, 3d long obconic, slender at the base, the following short and truncated at the apex, gradually increasing in size to the terminal one, which is ovate and obtuse: maxillary palpi with the penultimate joint large and much thickened at the apex, the terminal one slender and subulate: body elongate, attenuated at both ends: thorax large, considerably narrowed in front: elytra one-half longer than the thorax, and marked with punctured striæ: abdomen long, linear-conic: tibiæ spinose.—*Steph. Illus.* v. 168.

I. lépidum.—Glossy black, the mouth, base of the antennæ and legs rufo-testaceous, elytra pitch-black, with three punctured striæ. 1¾–2.—*Steph. Tachinus lepidus, Grav. Tachyporus lepidus, Gyllen.*

Narrow and linear, somewhat attenuated at both ends, shining black, glabrous: head small and rounded, glossy black, impunctate; mouth and palpi reddish; antennæ dusky, the base reddish: thorax widely emarginate in front, the angles deflexed and acute, the sides narrowly margined, and the hinder angles rounded, the surface very convex, glossy pitch-black, glabrous and impunctate, with two impressions within the anterior margin, two others, often obsolete, on the disk, and several scattered along the sides; the hinder margin generally reddish: elytra similar to the thorax in colour, the hinder margin more or less reddish, the surface of each marked with three punctured striæ, one near the suture, another in the middle, and a third composed of small punctures at the outer margin: abdomen more than thrice the length of the elytra, linear, with elevated margins, shining black, and punctured, the margins of the segments and the whole of the terminal one reddish: legs testaceous-red.

Found among grass, under stones, &c.: not very common. Fields near Saughtonhall.

Var. b. Elytra sanguineous, somewhat dusky on the sides; antennæ testaceous.—*Isch. punctato-striatus, Steph.*

GENUS—MEGACRÓNUS, *Steph.* From μιγα, *large*, and ακρων, *extremity of the limb.*—Antennæ longer than the thorax, and rather thick, the radical joint robust and elongate, thickened at the apex, 2d short and obconic, 3d longer than the 2d, obconic, 4–10 short and nodose, terminal variable in form, generally cylindric-ovate: maxillary palpi filiform, the terminal joint longer than the penultimate, and somewhat acuminated: body narrow and elongate, attenuated at both ends: head rounded: thorax transverse, the hinder angles rounded: elytra wide, and longer than the thorax: abdomen long, and somewhat conical, more or less beset with strong hairs: tibiæ spinose.—*Steph. Illus.* v. 164.

M. anális.—Shining black, with the elytra, legs, and apex of the abdomen, together with the base and terminal joint of the antennæ, yellowish-red. 2½–3.—*Steph. Staph. analis, Oliv. Fab. Marsh.*

Head glossy black, impunctate; mouth and palpi testaceous; base of the antennæ and the terminal joint testaceous, the rest pitchy-black: thorax narrowly margined on the sides, the base rounded, with the angles obtuse, the surface smooth and black, with two punctures near the apex, a few near the sides, and two towards the base: elytra pale red, smooth and glossy, with a slight metallic lustre in certain lights, and impressed with three rows of punctures: abdomen long, convex, shining black, and thinly clothed with greyish decumbent hairs, the anal segment, and hinder part of the penultimate one, rufous: legs testaceous.

Beneath stones, not uncommon in some places. Blackford Hill. Woods at Dreghorn, &c.

GENUS—ALEÓCHARA, *Knoch.*—Antennæ generally thickening towards the apex, the three radical joints clavate, the 1st longest, 2d and 3d shortest, remainder short, terminal ovate: maxillary palpi with the terminal joint slender and somewhat clavate: body elongate, rather thick: head suborbicular: abdomen margined, flat above, and convex beneath; legs slender, and without spines.—*Grav. Microp.* 67.

Gravenhorst, to whom we owe the establishment of this genus, included in his earlier work (*Coleoptera Microptera*, 1802) under the name of *Aleochara*, many species which in his later publication (*Monographia Coleopterorum micropterorum*, 1806) he distinguished by the generic title of *Lomechusa*. Latreille, while he adopted these two genera, appears to have in some measure transposed their constituent parts, and to have distinguished them by different characters. He refers to *Aleochara* the first three and the sixth families of Gravenhorst, while the fourth and fifth are united to *Lomechusa*. The French naturalist is of opinion that neither Gyllenhal nor Gravenhorst have assigned clear and rigorous characters to these genera, both of which he thinks still require revision.

The *Aleocharæ* are active little insects, and occur under stones, and on boleti more or less decomposed. The species are exceedingly numerous. Gravenhorst, in his Monographia, describes seventy-six different kinds—Gyllenhal, Dall, Knoch, De Jean, and other continental writers, have greatly increased that number—while (so abundant is Britain in these tiny tribes) Mr Stephens enumerates no less than 172 indigenous species. Some of these are observed to assume singular attitudes, with a view to disguise their natural or living aspect. A diminutive species in Mr Kirby's collection (*A. complicans*, K.) first attracted its owner's attention as a very minute, round, shining black pebble. This imitation was produced by folding its head under its breast, and turning up its abdomen over the elytra; "so that," says Mr Kirby, "the most piercing and discriminating eye could never have discovered it to be an insect."

A. *Elytra transverse: thorax much wider than the head: antennæ short and thick.*

A. fúscipes.—Black, somewhat shining, elytra red, with the base and outer margin black, legs pitch-red. 3–3¾.—*Grav. Gyllen. Staph. fuscipes, Payk. Marsh.*

One of the largest species of the genus, but very variable in size; head shining black, sparingly punctured, and pubescent, the mouth pitchy, the palpi inclining to ferruginous; antennæ short, thickened in the middle, of a black colour, reddish at the base: thorax rounded on the sides and behind, where it is considerably dilated, shining black, rather thickly covered with shallow punctures: elytra very short, depressed, rather rugosely punctured, and pubescent, of a shining red colour, with the base of the outer margin, and often a narrow streak along the suture at the base, black: abdomen very long and thick, black, with thinly scattered punctures: legs reddish, more or less pitchy.

On wall tops by the sides of high ways, in cattle pastures, and the vicinity of stables, &c.; frequent throughout the kingdom.

A. cóncolor.—Black, somewhat shining, elytra punctured and clothed with ashy pubescence, legs brown. 2–2½.—*Kirby. Steph.*

Of a uniform black colour, rather shining; head narrow, the thorax large, much widened behind, and rounded, the surface with very fine brownish pubescence: elytra short and transverse, rather thickly covered with large punctures, and long pubescence of a brownish hue; abdomen long, black, and shining, marked with a few remote punctures: legs pitch-red or brownish.

Seemingly pretty frequent in this neighbourhood, found in such places as the preceding.

A. limbáta.—Testaceous, the head, a band across the abdomen, and the disk of the elytra behind dusky black. 2¼–2¾.—*Grav. Gyllen. Staph. limbatus, Payk. Marsh.*

Head much narrower than the thorax, black, inclining to pitchy, the mouth and palpi reddish; antennæ brownish-testaceous, the terminal joint somewhat ovate, as long as the three preceding ones: thorax approaching to semicircular, the front being rather widest, and the hinder part rounded, without projecting angles; the surface rather convex, very minutely punctured, covered with fine yellowish pubescence, and having a broad shallow impression in the centre behind, which is narrowed anteriorly, and extends beyond the middle; the colour brownish-black, with the margins pale yellowish: elytra wider than the thorax, likewise brownish-black, with pale margins, the surface thickly punctured and pubescent: abdomen with the three first segments testaceous, the next three dusky black, the apex testaceous: under side ferruginous, the legs paler.

Under stones in woods and fields, not scarce during the early spring months. King's Park, and fields round the base of Arthur's Seat. Blackford Hill.

A. pusílla.—Black, slightly shining, antennæ, elytra and legs testaceous, thorax with two very obsolete foveolæ in the middle behind. 1. —*Grav. Gyllen.*

Head rounded, black, and slightly shining; antennæ dusky-ferruginous, the base, together with the palpi, paler: thorax considerably widest in front, rather depressed above, black, and almost imperceptibly punctulated, with a shallow impression behind, apparently formed by the junction of two others: abdomen not so long as the rest of the body, black, the terminal segment sometimes reddish.

Of occasional occurrence in this neighbourhood; likewise in Roxburghshire.

A. téres.—Black, rather shining, mouth and antennæ obscurely ferruginous, elytra pitchy, legs testaceous, thorax with a very obsolete impression behind. 1¼.—*Grav. Gyllen. Steph.*

Rather longer than the preceding, shining black; head nearly as wide as the thorax, rounded, glossy black, the mouth, palpi and antennæ, obscurely ferruginous: thorax rather short, somewhat quadrate, shining black, minutely punctulated, and occasionally marked with a very faint impression before the scutellum: elytra longer and wider than the thorax, dull pitchy-red, minutely punctured, and pubescent: abdomen longer than the rest of the body, shining black, the extremity indistinctly piceous: under side shining black, the legs dull testaceous.

Not very common: we have seen specimens from the neighbourhood of Portobéllo and also from the south of Scotland.

Few Scotch species of this extensive genus have been satisfactorily determined. The following, however, have been observed in the more southern counties: *A. picata, A. foveatocollis, A. emarginata.*

GENUS—**DRUSÍLLA**, *Leach.*—Antennæ rather longer than the thorax, thick, the radical joint very large and clavate, 2d and 3d shorter and obconic, the remainder short and thick, the terminal joint longest and conic: maxillary palpi elongate and filiform, the penultimate joint scarcely thickened, the terminal one very slender and minute: head transverse, depressed: thorax somewhat obovate, immarginate: elytra wider than the thorax, and rather shorter: abdomen long and thick: legs slender, without spines; hinder tarsi long and slender (Pl. II. fig. 23).

D. canaliculáta.—Testaceous, very thickly punctured, the head and a band across the abdomen dusky black. 2¼.—*Aleochara canaliculata, Grav. Gyllen. Steph. Staph. canaliculatus, Fab. Marsh.*

Head nearly as wide as the thorax, dusky; palpi testaceous, antennæ dusky, testaceous at the base: thorax narrowest behind, where it is rounded, almost the entire surface occupied by a deep wide groove, extending from the front to the hinder edge; the colour testaceous red; elytra obscure testaceous, thickly and rather rugosely punctured, with silky pubescence: abdomen testaceous red, shining and pubescent, the two antepenultimate segments black: legs pale testaceous.

Under stones in fields and woods, not unfrequent.

IN HIS TAM PARVIS TAMQUE FERE NULLIS, QUÆ RATIO! QUANTA VIS! QUAM INEXTRICABILIS PERFECTIO!

ADDENDA.

The following species have been observed in Scotland since the preceding pages were printed. The Dumfries-shire localities were supplied by the Rev. Wm. Little.

Carabus clathratus; of occasional occurrence in Sutherland (*Captain Graham*, R.N.) Aberdeen, and Argyllshire.
Argutor vernalis. Dumfries-shire.
Leiodes badia. Cramond.
—— fuscicollis. Ditto. *An undescribed species.*
Clambus enshamensis. Raehills.
Meligethes xanthoceras, *Steph.* Cramond.
Antherophagus glaber. Moffat.
Ips quadripunctata. Raehills.
Throscus desmestoides. Ditto.
Byrrhus aeneus. Taken in considerable number last autumn, by Dr Greville, in the west of Sutherlandshire.
Hister neglectus. "Forfarshire." *Misses Lyell.*
Typhæus vulgaris. Ditto Ditto.
Trichius fasciatus. Sutherlandshire. *Mr T. Munby.*
Ctenicerus tessellatus. Glen Clova and Argyllshire.
Malthinus concolor. Dalmeny.
Anthonomus incurvus. Raehills.
—— Ulmi. Ditto.
Erirhinus bimaculatus. Roxburghshire.
Liophlæus maurus. "Forfarshire." *Misses Lyell.*
Pogonocherus pilosus. Moffat.
Lamia Textor. "Argyllshire." *Mr G. Little.*
Chrysomela fulgida. Kirktown of Clova, Forfarshire.
Scydmaenus tarsatus. Raehills.
—— pusillus. Ditto.
Quedius humeralis. Raehills.
—— fulvipes. Ditto.
Philonthus melanopterus. Ditto.
—— decorus. Ditto.
—— intaminatus Ditto.
—— obscuripennis. Ditto.
Cafius fucicola, Dalmeny.
Gabrius aterrimus. Ditto.
Othius pilicornis. Raehills.
—— angustus. Ditto.
—— læviusculus. Ditto.
—— obscurus. Ditto.
Lathrobium quadratum. Ditto.
—— brunnipes. Ditto.
—— fulvipenne. Ditto.

Stenus pallipes. Moffat.
——— nigriclavis. Raehills.
——— Aceris. Roxburghshire.
——— melanopus. Ditto.
——— pusillus. Ditto.
Oxytelus cornutus. Raehills.
——— laqueatus. Ditto.
Anthobium Ulmariæ. Ditto.
——— torquatum. Ditto.
Acidota crenata. Near Hawick, and in Aberdeenshire.
Tachyporus minimus. Moffat.
——— merdarius. Ditto.
——— pyrrhoceras. Ditto.
Bolitobius angularis. Raehills.
——— pygmæus. Ditto.
——— ruficollis. Ditto and Roxburghshire.
Aleochara fasciata. Raehills.
——— lanuginosa. Ditto.
——— 2-maculata. Ditto.
Encephalus complicans. Cramond.
Falagria sulcata. Near Denholm, Roxburghshire.
Autalia impressa. Raehills.
Euplectus Reichenbachii. Ditto.
Tychus niger. Braidhills.
Bryaxis impressa. Roxburghshire, in fungi during the months of October and November, plentiful.

NOTES.

"As the mouth is covered above by the labrum or upper lip, so it is closed beneath by the under lip or *labium*," Introduction, p. 18. Some contrariety of opinion seems to exist in regard to the nomenclature of the last named portion. Mr Macleay bestows the name of *mentum* on the middle piece of the lower apparatus of the mouth. Its anterior portion, to which the palpi are so frequently attached, he calls the *labium*, while the basal part of the mentum is designated the *stipes*. In this view the labium of Macleay corresponds to the *ligula* or rather *tongue* of Kirby, while the mentum of the latter is analogous to the stipes of the former,—for it appears that the term mentum is applied by the authors of the "Introduction to Entomology," only to the lower division of the labium, when that organ (as in *Hydrous piceus*) appears to consist of two joints or pieces. When there is no apparent division, or the only separation consists in a transverse elevated line (as in some lamellicorn beetles), or an obtuse angle formed by the meeting of the two parts, then the entire piece (the *mentum* merging in it) is regarded by Mr Kirby as the *labium*. Messrs Curtis and Stephens apply the term mentum to designate the lower lip in general, in contradistinction to the labrum or upper lip.

On page 34, we have observed that no coleopterous insect possesses simple eyes, after attaining completion. They are certainly by no means usual in that order, but we did not bear in mind a few recorded exceptions. Stemmatic eyes are mentioned in the fourth volume, page 410, of Germar and Zincken Von Sommers's *Magazin der Entomologie*, as discoverable in some species of the genus *Omalium* of Gravenhorst; and Mr Kirby found them very obvious in *A. Caraboides*, and other Anthophagi.

We have used the terms *simple* and *stemmatic* eyes synonymously, and as corresponding to the *stemmata* of Kirby, who applies the term, as we have done, to those shining spots so frequently observable on the posterior portion of the front of insects, or upon the vertex, and usually arranged in a triangle. They are regarded as subsidiary or additional to the larger, or compound eyes. Mr Kirby, however, seems to reserve the term *simple eyes* to the ordinary organs of sight of the Arachnides and Myriapoda, which are supposed to be each composed of a single lens, and to those of such larvæ as do not possess compound eyes. His reason for the distinction seems to be, that as the simple eyes of Arachnides, &c. are *primary* organs of vision, and the stemmata being only *secondary* in relation to that function, it was better to distinguish them by different names. Stemmata are certainly very analogous to simple eyes, although the latter may not always with equal propriety be called stemmatic. Yet it appears that the French naturalists use the terms *yeux lisses ou simples* and *stemmates* indifferently, and each in contradistinction to *les yeux chagrinés ou composés*.

At page 56, it is stated in regard to the transformations of the Coleopterous tribes, that "these are of the kind formerly mentioned under the name of *complete* metamorphoses," while on the preceding page we have quoted "metamorphoses *incomplete*" as a part of Mr Kirby's definition of the order. Considerable contrariety seems to exist in the use of these terms in the writings even of the "Master Spirits" of Entomology. Thus, M. Latreille observes, "Les Coleoptères subissent une metamorphose complète*;" while Mr Macleay adopts the same expression as that used by Mr Kirby.† This confusion may perhaps have arisen from certain adjective phrases having been at times applied indifferently, either to the state of pupa, or the phenomena of transformation, which in most cases causes a contradiction in terms. In Orthoptera, of which the pupa is semi-complete, the metamorphosis may bear the same name; but in the other orders the double application of any of the adjective terms leads to inaccurate ideas. Thus, in Coleoptera, the pupæ are *semi-complete;* but there is surely a total transformation, that is, a *complete* metamorphosis, when we compare together the larvæ and the perfect insect. So also in Lepidoptera, the pupa is obtected; in Diptera, coarctate; and consequently the metamorphoses must be *complete* in both. Now, Mr Kirby makes use of the phrase "metamorphosis obtected" in regard to the former, and "metamorphosis coarctate" in relation to the latter, terms which we have been in the practice of applying to the pupà state of these orders, but not to the general transformations. The same admirable author, in defining apterous insects, states the metamorphosis to be *complete*. We would rather say that they undergo *no* metamorphosis at all,—for which very reason, each particular state, or rather period, of the insect, is itself complete from youth to age. The less complete the pupa, the more complete the metamorphosis, and *vice versa*.

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* *Règne Animal,* t. iv. p. 354.

† Coleoptera, Larvæ variæ, metamorphosis incompleta."—*Horæ Ent.* p. 440.

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PRINTED BY NEILL & CO.
OLD FISHMARKET, EDINBURGH.